MICROCOPY RESOLUTION TEST CHART

NATIONAL BUREAU OF STANDARDS-1963-A

AD-A171 333

WIND TUNNEL DATA
FROM A
ROTOR WAKE/AIRFRAME
INTERACTION STUDY

DTIC
SELECTED
AUG 2 6 1986
D

School of Aerospace Engineering

GEORGIA INSTITUTE OF TECHNOLOGY

Atlanta, Georgia 30332

DTIC FILE COPY

86 8   939

WIND TUNNEL DATA
FROM A
ROTOR WAKE/AIRFRAME
INTERACTION STUDY

A.G. Brand, N.M. Komerath, H.M. McMahon

School of Aerospace Engineering
Georgia Institute of Technology
Atlanta, Ga. 30332

INTRODUCTION

Accurate prediction and understanding of the aerodynamic interactions between a rotor and airframe are essential to the improvement of future rotorcraft. Large amounts of energy are added by the lifting rotor to an otherwise uniform free stream. The resulting wake flow interaction with the airframe has led to problems in dynamics, performance, acoustics and handling qualities.

The interaction phenomena associated with a rotor/airframe in forward flight are currently under study as part of a research effort in the Rotary Wing Technology Center sponsored by the U.S. Army at Georgia Tech. The objective of this program is the systematic measurement of interaction effects and the validation of prediction codes using these measurements.

This report presents the aerodynamic interaction data base that has been generated in experiments conducted in the John J. Harper 7x9-foot wind tunnel at Georgia Tech. It is hoped that these results will be useful as a guide in the development of prediction codes as well as providing a test for their validity.

Accesion For		
NTIS CRA&I		☑
DTIC TAB		☐
Unannounced		☐
Justification		
By		
Distribution /		
Availability Codes		
Dist	Avail and/or Special	
A-1		

FACILITY DESCRIPTION

The John J. Harper 7x9-foot low-speed wind tunnel at Georgia Tech is shown in Fig.1 with the rotorcraft test configuration installed. The idealized airframe is a cylinder 134mm in diameter with a hemispherical nose and is supported on a sting mount. A two-bladed rotor is mounted independent of the airframe on a drive shaft projecting down from the wind tunnel ceiling .

Since there are no collective or cyclic controls, the shaft itself is inclined 6 degrees upstream so that forward flight can be simulated. The rotor is designed to be very stiff, resulting in a negligible coning angle. The blade is an untwisted constant-section NACA 0015 airfoil of radius .45m with constant 86mm chord (12% solidity) . The rotor is made of steel and wood, and is manufactured as a single piece with a fixed blade pitch of 10 degrees. Total rotor weight is 2.54 kg. Detailed dimensions are shown in Fig. 2.

Effort was made to minimize the interference between the rotor hub and airframe by selecting a simple hub design. The hub is U-shaped, 25mm thick, 51mm wide and 71mm to the top of the U. The one-piece blade is clamped in the lower portion of the U while the top of the U is pinned to the drive shaft. This gives a simple teetering arrangement with minimum hub profile. The hub and rotor are shown in Fig. 3.

For tests described here, the rotor speed was kept constant at 2100 rpm. Advance ratio was varied by changing the test section freestream velocity, which may be increased continuously to 75m/s. Spacing between the rotor and airframe

centerline was changed by vertical movement of the sting mount. The spacing

distance is normalized by the rotor radius and is denoted by the parameter H/R.

Two values used for these tests are H/R=.3 and H/R=.5.

The axial distance between the rotor hub and the airframe nose was

adjusted by sliding the model forward or rearward on its sting mount. The

parameter XN/R denotes this axial spacing normalized by rotor radius. Two values

of XN/R used for these tests are XN/R=-1.0, and XN/R=-.6.

DATA ACQUISITION SYSTEM

The data acquisition system is shown schematically in Fig. 4. The airframe is fitted with a line of 53 static pressure taps originating at the nose of the model and terminating at the rear. Since the model is axially symmetric, pressure data can be obtained anywhere on the surface by rotating the airframe on its axis. The angle (PHI) locating the pressure taps is measured from the top of the model as shown in Fig. 1. The model also has 3 rings of static pressure taps at different axial positions. Data from these taps confirm repeatability and, since these data are redundant, they are not included in this report.

Pneumatic switches sequentially connect the pressure taps to a pressure transducer. Analog signals from the transducer are sent through a 16-channel analog-digital converter to a 16-bit minicomputer system. Pneumatic switching control, transducer range setting, signal sampling, digitization and data processing are performed under software control. Ample time delays are introduced to allow for the pressure to stabilize when sampling successive pressure taps. Each mean pressure sample extends over a time interval corresponding to 140 rotor revolutions.

Measurement of the unsteady component of the surface pressure is accomplished by use of 18 microphone ports in the airframe. Only 4 microphones are used at any one time, thus it is necessary to move the microphones from port to port as different needs dictate. The axial location of each port and pressure tap is expressed in terms of distance from the airframe nose normalized by the rotor radius. Microphone locations for a given test are denoted as XB1/R through XB4/R.

Four 6.25mm condenser microphones are mounted flush with the airframe surface. They supply signals that are used to determine the unsteady component of the surface pressure, relative to the mean pressure. Sampling of the microphone signals is synchronized with a pulse from a rotor shaft encoder. The digitized data are sorted into 6-degree rotor azimuth intervals and the data within each interval are averaged to provide statistical accuracy. Software converts the raw microphone data into unsteady pressure coefficients based on the calibration constants for each microphone and the operating conditions of the test. Pressure taps give mean quantities, while microphones give unsteady ones. The two components must be added locally to give the instantaneous or total values.

The pressure coefficients used herein are defined as.

$$Cp \text{ mean} = (P \text{ mean} - P_\infty) / q_\infty$$

and

$$Cp \text{ instantaneous} = (P \text{ instantaneous} - P_\infty) / q_\infty$$

where,

$$P \text{ instantaneous} = P \text{ mean} + P \text{ unsteady}.$$

It can be shown that

$$Cp \text{ instantaneous} = Cp \text{ mean} + Cp \text{ unsteady}$$

where,

$$Cp \text{ unsteady} = P \text{ unsteady} / q_\infty.$$

MEAN PRESSURE DATA

The time-averaged pressure at the 53 pressure tap locations is measured sequentially for various combinations of XN/R, H/R and PHI. For each of these positions, data are taken for two or more advance ratios. The measured pressures are converted to mean pressure coefficient using the freestream dynamic pressure.

Tables 1 through 10 contain the mean pressure coefficient data. Geometric parameters XN/R and H/R are included with the test advance ratio. Each of these parameters is constant for a particular table. Columns of mean pressure coefficient data are adjacent to the XB/R location of each static pressure tap. The columns labeled Cp represent the mean pressure coefficient values at the designated pressure tap for the specified roll angle (PHI). Sample plots of data are included in Figs. 5 and 6 in the appendix of this report.

Note that these tests are conducted at constant advance ratio for a particular table. Since the line of 53 static pressure taps has to be rotated to obtain a complete table, wind tunnel runs extended over a period of days. Thus, the dynamic pressure required to achieve the same value of advance ratio varied somewhat. Typical values of dynamic pressure for the advance ratios used are given in the tables of this report. The units are in mmHg.

Repeatability of the experimental results has been demonstrated by duplicating some of the test conditions over a span of several months. Typical cases showing repeatability are shown in Figs. 7 and 8 in the appendix of this report.

UNSTEADY PRESSURE DATA

Tables 11 through 42 contain the unsteady pressure coefficient data as a function of rotor blade azimuth angle (AZ). The rotor azimuth angle corresponds to zero when the rotor is aligned with the airframe. The values of XN/R, H/R and PHI are indicated, along with the locations of the four microphones. For any particular table, the above parameters are kept constant.

Data for two advance ratios are printed side by side, adjacent to a column indicating the azimuth angle of the rotor blade at the instant data is taken. Advance ratios and the associated freestream dynamic pressure (in mmHg) are printed above each case. Columns labeled Cp 1 through Cp 4 give the unsteady pressure coefficient as a function of blade azimuth angle in 6 degree increments. The number after Cp indicates which microphone the data is from. That is, Cp 1 is from microphone 1 which is at the axial location XB1/R.

Plots of microphone data for certain tables are included in Figs. 9 and 10 in the appendix of this report. Repeatability of these experimental results is demonstrated in Figs. 11 and 12. For these figures, test conditions were duplicated over a time span of several weeks. The repeatability is seen to be excellent.

TEST SECTION SIDE VIEW

FLOW

A

A

2.31 M

2.74 M

8

VIEW A-A

FLOW

Z 6°

X

$X_N/R=-.6$

$X_N/R=-1.0$

H/R=.3

X_B

H/R=.3

R

PHI (Φ)

H/R=.5
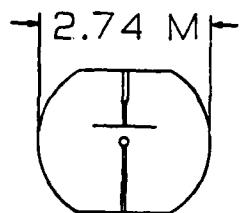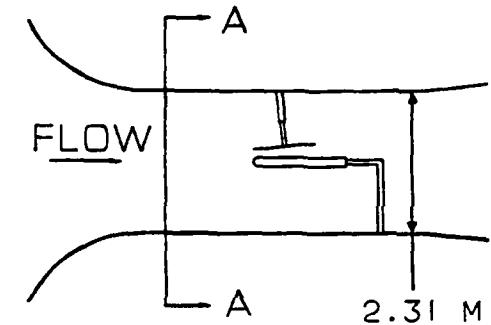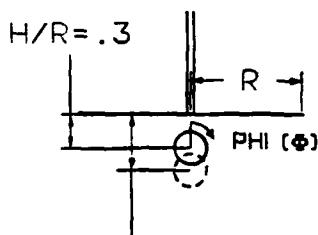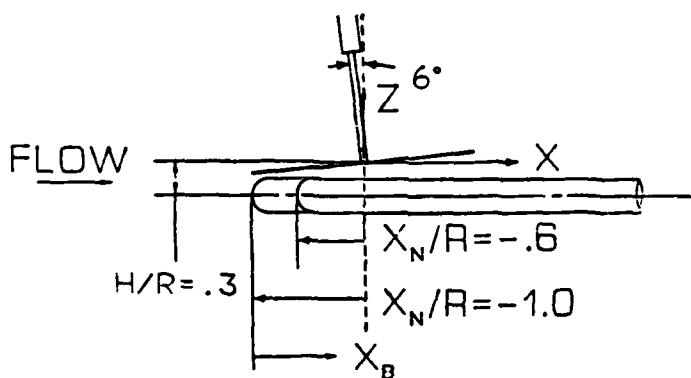
LOOKING UPSTREAM

FIG. 1. TEST CONFIGURATION

A

A

.45 M

86 MM

2.54 CM

NACA-0015

10°
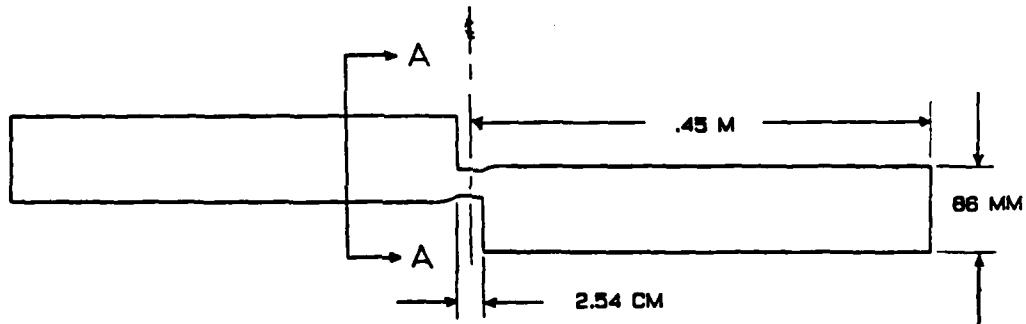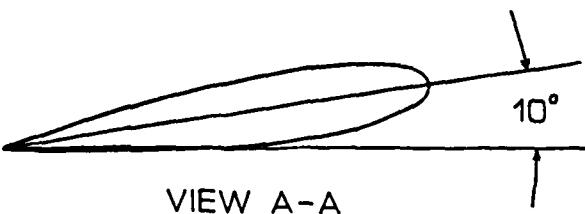
VIEW A-A

FIG. 2. ROTOR BLADE DETAIL

ROTOR DRIVE SHAFT

FLAPPING HINGE
AXIS

31 mm

71 mm

69 mm

51 mm

25 mm

FIG. 3. ROTOR HUB DETAIL

MICROPHONES

AMPLIFIERS

PRESSURE TAPS

CHANNEL
SELECTOR

ROTOR SHAFT
ENCODER

16 CHANNEL
A-D CONVERTER

PRESSURE
TRANSDUCER

INTERFACE

HP 1000 A700
COMPUTER

GRAPHICS
TERMINAL

85 MB DISC

GRAPHICS
PRINTER

TAPES
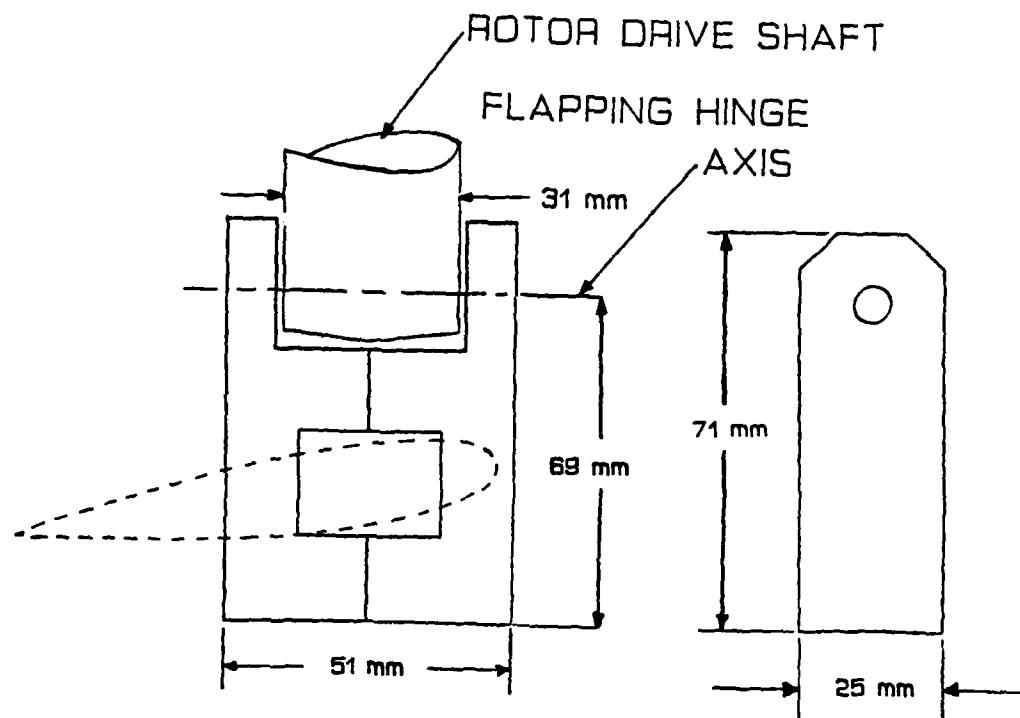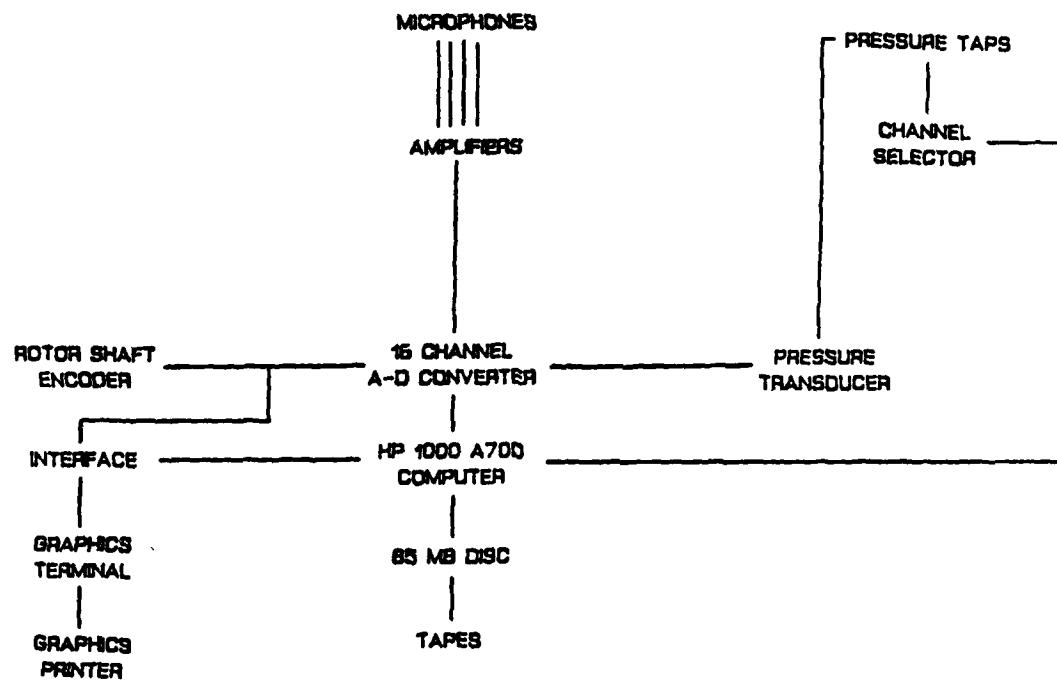
FIG. 4. DATA ACQUISITION SCHEMATIC

LIST OF TABLES

MEAN SURFACE PRESSURE DATA

TABLE NO.	MU	H/R	XN/R
1	.075	.3	-1.0
2	.10	.3	-1.0
3	.15	.3	-1.0
4	.20	.3	-1.0
5	.10	.5	-1.0
6	.20	.5	-1.0
7	.10	.3	-.6
8	.20	.3	-.6
9	.10	.5	-.6
10	.20	.5	-.6

UNSTEADY SURFACE PRESSURE DATA

TABLE NO.	PHI	MU	XN/R	H/R
11	0	.075 & .10	-1.0	.30
12	45	.075 & .10	-1.0	.30
13	90	.075 & .10	-1.0	.30
14	135	.075 & .10	-1.0	.30
15	180	.075 & .10	-1.0	.30
16	225	.075 & .10	-1.0	.30
17	270	.075 & .10	-1.0	.30
18	315	.075 & .10	-1.0	.30
19	0	.15 & .20	-1.0	.30
20	45	.15 & .20	-1.0	.30
21	90	.15 & .20	-1.0	.30
22	135	.15 & .20	-1.0	.30
23	180	.15 & .20	-1.0	.30
24	225	.15 & .20	-1.0	.30
25	270	.15 & .20	-1.0	.30
26	315	.15 & .20	-1.0	.30
27	0	.10 & .20	-.6	.30
28	90	.10 & .20	-.6	.30
29	180	.10 & .20	-.6	.30
30	270	.10 & .20	-.6	.30
31	0	.10 & .20	-1.0	.50
32	45	.10 & .20	-1.0	.50
33	90	.10 & .20	-1.0	.50
34	135	.10 & .20	-1.0	.50
35	180	.10 & .20	-1.0	.50
36	225	.10 & .20	-1.0	.50
37	270	.10 & .20	-1.0	.50
38	315	.10 & .20	-1.0	.50
39	0	.10 & .20	-.6	.50
40	90	.10 & .20	-.6	.50
41	180	.10 & .20	-.6	.50
42	270	.10 & .20	-.6	.50

TABLE 1

MEAN CP VERSUS XB/R FOR VARYING PHI

XN/R= -1.0   H/R= .3   ADVANCE RATIO= .075

PHI=	0	45	90	135	180	225	270	315
XB/R	CP	CP	CP	CP	CP	CP	CP	CP
0.0000	.8936	.8811	.8657	.8889	.8908	.8865	.8798	.8678
.0100	.5970	.6493	.7767	.9182	.9649	.9163	.7972	.6441
.0200	.2713	.3582	.5770	.7605	.8161	.7478	.5829	.3598
.0400	.1694	.2330	.3784	.4991	.5343	.4838	.3615	.2193
.0800	.2261	.2895	.3280	.2721	.2546	.2429	.2604	.2384
.1100	.2177	.3104	.3280	.2638	.2500	.2340	.2990	.2401
.1600	.4484	.4648	.4646	.3208	.2690	.2778	.3691	.4943
.2000	.3338	.6005	.4939	.3349	.2773	.2887	.4650	.5695
.2400	.2583	.6452	.4271	.4491	.3721	.4289	.4471	.4959
.2800	1.2446	.5252	.4116	.4724	.4406	.4538	.4019	.2055
.3300	3.0596	-.1751	.3953	.4713	.4544	.4561	.3699	-.6877
.3700	2.9036	-.1150	.2507	.4547	.4610	.4546	.3075	-.4337
.4100	2.2051	1.7202	-.3163	.4322	.4651	.4485	.1126	.1578
.4500	1.8310	2.0296	-.5658	.3994	.4695	.4438	-.4650	.2838
.4900	1.5441	1.6854	-.4068	.3376	.4653	.4386	-1.2951	.1885
.5300	1.3645	1.2397	-.6215	.1711	.4637	.4309	-.4727	.1660
.5800	1.1848	.9944	-.5489	-.3030	.4607	.4174	-.0648	.0941
.6200	1.0292	.8722	-.3930	-.6227	.4547	.3802	.0016	.0235
.6600	.8909	.7690	-.3190	-.5648	.4419	.3077	.0230	-.0275
.7000	.7593	.7237	-.2620	-.1646	.4176	.2142	.0313	-.0726
.7400	.6457	.6658	-.2138	.0078	.3843	.1141	.0267	-.0877
.8000	.4999	.6234	-.1886	.0810	.3225	.0593	.0460	-.1097
.8400	.4004	.5868	-.1632	.1045	.2729	.0395	.0683	-.1093
.8800	.3256	.5643	-.1540	.1086	.1866	.0329	.0777	-.0837
.9200	.2720	.5709	-.1141	.1154	.1011	.0172	.1189	-.0230
.9600	.1953	.5632	-.0769	.1005	.0368	.0283	.1735	.0264
1.0100	.1801	.5853	-.0295	.0972	-.0240	.0108	.2158	.1116
1.0500	.2519	.6303	.0175	.0783	-.0711	.0300	.2807	.2341
1.0900	.3633	.6635	.0351	.0678	-.1446	.0382	.3280	.3395
1.1300	.5126	.7157	.0548	.0612	-.1469	.0919	.3746	.4542
1.1700	.6275	.7535	.0712	.0534	-.0952	.1311	.4171	.5435
1.2100	.7218	.7806	.0782	.0296	-.0735	.2089	.4405	.6244
1.2600	.7959	.8028	.0857	.0174	-.0306	.2748	.4601	.7049
1.3000	.8593	.8103	.0639	.0030	.0365	.3375	.4753	.7797
1.3400	.9224	.8007	.0461	-.0131	.0837	.3948	.4803	.8503
1.3800	.9939	.7597	.0178	-.0304	.1369	.4415	.4810	.9155

TABLE 1 CONTINUED

PHI=	0	45	90	135	180	225	270	315
XB/R	CP	CP	CP	CP	CP	CP	CP	CP
1.4200	1.0877	.6924	-.0517	-.0549	.1719	.4665	.4634	.9690
1.4600	1.2126	.6112	-.1306	-.0664	.1675	.4835	.4424	1.0072
1.5100	1.3674	.5156	-.2416	-.0822	.2079	.5052	.4278	1.0467
1.5500	1.5542	.3948	-.4028	-.1224	.1916	.5112	.3896	1.0617
1.5900	1.7746	.3210	-.5781	-.1629	.2008	.5141	.3462	1.0825
1.6300	1.9994	.2328	-.7252	-.1846	.1856	.5166	.2992	1.0933
1.6700	2.1058	.0079	-.7220	-.2004	.1744	.5147	.2608	1.0620
1.7100	2.1275	-.5001	-.8469	-.1904	.1488	.4924	.1371	.6364
1.7600	3.2347	-.8399	-1.2848	-.1227	.1722	.4780	-.2370	.6083
1.8800	3.4787	-1.6228	-3.2912	-.1489	.1521	.0996	-2.0336	1.3931
2.0100	2.9644	-2.1634	-4.0318	-.6065	.0624	-.3474	-2.9180	.9344
2.1300	1.9725	-1.6779	-3.8921	-.4521	-.1602	-.8049	-3.3601	.2623
2.2600	1.1002	-1.1424	-3.3313	-.0989	-.4702	-1.1092	-3.5065	-.1218
2.3800	.6636	-.5032	-2.4367	-.1674	-.6718	-1.1793	-3.2984	-.3211
2.5100	.4280	-.2345	-1.4876	-.1713	-.6156	-1.4061	-2.0764	-.2929
2.6300	.2502	-.2082	-1.1631	-.3138	-.3265	-.7297	-1.3353	-.2627
2.7600	.0979	-.2509	-.9988	-.4103	-.2329	-.4845	-1.1318	-.2677

TABLE 2

MEAN CP VERSUS XB/R FOR VARYING PHI

XN/R= -1.0   H/R= .3   ADVANCE RATIO= .10

PHI=	0	45	90	135	180	225	270	315
XB/R	CP	CP	CP	CP	CP	CP	CP	CP
0.0000	.9481	.9498	.9473	.9517	.9549	.9393	.9445	.9464
.0100	.7009	.7453	.8372	.9234	.9358	.9024	.8328	.7504
.0200	.3513	.4254	.5653	.6795	.6921	.6532	.5512	.4259
.0400	.1106	.1520	.2512	.3263	.3323	.2942	.2237	.1423
.0800	.1400	.1064	.0403	.0045	-.0158	-.0318	-.0065	.0756
.1100	.1484	.1006	.0435	.0096	-.0161	-.0395	-.0139	.0770
.1600	.4283	.3552	.0918	.0486	.0128	.0142	.0447	.3026
.2000	.5651	.5078	.3847	.0573	.0308	.0874	.3063	.4746
.2400	.5448	.5127	.4235	.3194	.2390	.2789	.3592	.4730
.2800	.5067	.5324	.4245	.3342	.2670	.2977	.3589	.4456
.3300	.4742	.5339	.4191	.3451	.2810	.3069	.3517	.3889
.3700	.4764	.5070	.4028	.3501	.2944	.3123	.3296	.3037
.4100	1.4362	.4298	.3802	.3495	.3034	.3135	.3101	.1451
.4500	1.6256	-.0553	.3486	.3466	.3126	.3131	.2870	-.4052
.4900	1.2753	.0414	.3036	.3400	.3169	.3084	.2482	-.2770
.5300	.9845	.8848	.1626	.3314	.3196	.3039	.1969	.0718
.5800	.7830	.9986	-.0964	.3194	.3195	.2987	.1018	.1358
.6200	.6588	.8891	-.1247	.3091	.3204	.2957	-.0964	.1263
.6600	.5568	.7372	-.0978	.2889	.3180	.2918	-.2751	.0915
.7000	.4656	.6412	-.1009	.2518	.3167	.2867	-.4542	.0462
.7400	.3937	.5488	-.0432	.1480	.3096	.2830	-.5053	.0181
.8000	.3007	.4747	.0377	-.0456	.3015	.2757	-.0358	-.0118
.8400	.2377	.4351	.0906	-.1512	.2952	.2655	.0488	-.0247
.8800	.1806	.4056	.1412	-.2579	.2867	.2533	.1007	-.0192
.9200	.1327	.4020	.1952	.0147	.2811	.2445	.1427	.0078
.9600	.0523	.3833	.2144	.0986	.2698	.2270	.1682	.0253
1.0100	.0192	.3901	.2341	.1405	.2596	.2103	.1979	.0721
1.0500	.0736	.4213	.2573	.1751	.2492	.1995	.2393	.1508
1.0900	.1596	.4451	.2591	.1807	.2345	.1916	.2604	.2201
1.1300	.2850	.4949	.2772	.1936	.2157	.1915	.2905	.3042
1.1700	.3853	.5320	.2880	.1894	.1859	.1947	.3049	.3727
1.2100	.4697	.5652	.2928	.1816	.1558	.1995	.3235	.4321
1.2600	.5431	.5937	.2993	.1759	.1275	.2076	.3435	.4829
1.3000	.6016	.6115	.2928	.1674	.0988	.2150	.3620	.5209
1.3400	.6478	.6288	.2861	.1614	.0779	.2226	.3785	.5574
1.3800	.6854	.6415	.2743	.1576	.0722	.2355	.3906	.5854

TABLE 2 CONTINUED

PHI=	0	45	90	135	180	225	270	315
XB/R	CP	CP	CP	CP	CP	CP	CP	CP
1.4200	.7240	.6371	.2453	.1410	.0505	.2366	.3932	.6106
1.4600	.7678	.6378	.2201	.1232	.0445	.2401	.3880	.6334
1.5100	.8204	.6269	.1920	.1083	.0475	.2506	.3837	.6538
1.5500	.8731	.5925	.1377	.0811	.0356	.2543	.3617	.6619
1.5900	.9356	.5653	.0838	.0591	.0354	.2570	.3399	.6622
1.6300	1.0022	.5306	.0117	.0386	.0412	.2577	.3076	.6529
1.6700	1.0837	.4822	-.0714	.0168	.0439	.2604	.2756	.6429
1.7100	1.1684	.3881	-.1776	-.0157	.0372	.2564	.2274	.6080
1.7600	1.2604	.3065	-.2411	-.0255	.0561	.2690	.1932	.5962
1.8800	1.5337	-.1798	-.4927	-.0889	.0320	.2620	.0272	.3711
2.0100	1.7000	-.8089	-.8452	-.0620	.0249	.2109	-.4893	.4107
2.1300	1.1691	-1.0299	-1.3654	-.0637	.0099	.0022	-1.1217	.4878
2.2600	.6825	-1.0304	-1.5908	-.2967	-.0324	-.1303	-1.2324	.2040
2.3800	.4239	-.8498	-1.4821	-.3243	-.0890	-.1982	-1.2591	-.0375
2.5100	.3014	-.5802	-1.3840	-.2500	-.1676	-.2501	-1.2523	-.1624
2.6300	.1991	-.3650	-.9281	-.1962	-.2191	-.2951	-1.3225	-.1777
2.7600	.0815	-.3519	-.7496	-.1644	-.2630	-.4139	-1.0117	-.1902

TABLE 3

MEAN CP VERSUS XB/R FOR VARYING PHI

XN/R= -1.0   H/R= .3   ADVANCE RATIO= .15

PHI=	0	45	90	135	180	225	270	315
XB/R	CP	CP	CP	CP	CP	CP	CP	CP
0.0000	.9817	.9779	.9790	.9811	.9854	.9798	.9781	.9767
.0100	.7947	.8152	.8545	.8824	.8912	.8697	.8309	.8024
.0200	.4261	.4622	.5244	.5573	.5636	.5393	.4881	.4429
.0400	.0451	.0661	.1106	.1266	.1227	.0947	.0652	.0399
.0800	-.1755	-.2074	-.2363	-.2674	-.2893	-.3072	-.2934	-.2502
.1100	-.1795	-.2090	-.2308	-.2688	-.2892	-.3057	-.2964	-.2568
.1600	.0121	-.1009	-.1718	-.2314	-.2656	-.2676	-.2334	-.1430
.2000	.3150	.2612	.1671	.0308	.0132	.0133	.1138	.2127
.2400	.3617	.2898	.1932	.1057	.0655	.0840	.1457	.2397
.2800	.3787	.3121	.2171	.1283	.0906	.1064	.1680	.2627
.3300	.3768	.3188	.2311	.1468	.1092	.1246	.1821	.2669
.3700	.3629	.3163	.2381	.1609	.1245	.1385	.1884	.2594
.4100	.3399	.3027	.2370	.1689	.1345	.1474	.1894	.2415
.4500	.3174	.2886	.2339	.1766	.1459	.1560	.1868	.2127
.4900	.2818	.2729	.2235	.1786	.1504	.1568	.1744	.1771
.5300	.2456	.2561	.2133	.1796	.1546	.1593	.1658	.1473
.5800	.2027	.2413	.2039	.1784	.1564	.1577	.1526	.1156
.6200	.1260	.2355	.1968	.1793	.1597	.1570	.1405	.0902
.6600	.2233	.2311	.1897	.1772	.1610	.1559	.1311	.0654
.7000	.4301	.2141	.1841	.1765	.1625	.1546	.1209	.0252
.7400	.3481	.0523	.1774	.1748	.1638	.1527	.1124	-.0562
.8000	.2440	-.0054	.1623	.1721	.1643	.1501	.0998	-.2737
.8400	.1546	.2761	.1483	.1687	.1628	.1479	.0886	-.1991
.8800	.0793	.3233	.1258	.1648	.1619	.1467	.0781	-.1347
.9200	.0137	.3032	.0842	.1643	.1635	.1487	.0704	-.0854
.9600	-.0795	.2550	.0363	.1598	.1615	.1474	.0580	-.0743
1.0100	-.1284	.2290	-.0063	.1560	.1612	.1487	.0484	-.0503
1.0500	-.1069	.2310	.0229	.1538	.1618	.1517	.0433	-.0071
1.0900	-.0547	.2302	.0318	.1442	.1595	.1519	.0302	.0219
1.1300	.0416	.2601	.0631	.1337	.1595	.1554	.0321	.0681
1.1700	.1159	.2854	.0996	.1135	.1583	.1571	.0394	.1075
1.2100	.1725	.3105	.1304	.0896	.1562	.1587	.0487	.1456
1.2600	.2183	.3360	.1583	.0735	.1543	.1616	.0619	.1838
1.3000	.2556	.3548	.1750	.0610	.1519	.1632	.0729	.2187
1.3400	.2862	.3701	.1913	.0469	.1508	.1647	.0850	.2465
1.3800	.3107	.3800	.2032	.0248	.1486	.1656	.0941	.2705

TABLE 3 CONTINUED

PHI=	0	45	90	135	180	225	270	315
XB/R	CP	CP	CP	CP	CP	CP	CP	CP
1.4200	.3402	.3857	.2049	.0159	.1442	.1643	.0948	.2904
1.4600	.3628	.3917	.2096	.0502	.1407	.1638	.0957	.3043
1.5100	.3887	.3996	.2127	.0745	.1385	.1634	.0823	.3162
1.5500	.4042	.3951	.1941	.0765	.1328	.1588	.1328	.3151
1.5900	.4201	.3938	.1837	.0802	.1279	.1551	.1599	.3126
1.6300	.4271	.3838	.1636	.0752	.1215	.1490	.1607	.3018
1.6700	.4352	.3730	.1386	.0620	.1174	.1432	.1562	.2915
1.7100	.4338	.3415	.1010	.0399	.1062	.1345	.1431	.2657
1.7600	.4469	.3352	.0859	.0357	.1036	.1307	.1440	.2559
1.8800	.4587	.2280	-.0167	-.0041	.0747	.1129	.1059	.1670
2.0100	.4672	.0697	-.1157	-.0317	.0528	.0987	.0546	.0690
2.1300	.4861	-.1207	-.1834	-.0522	.0242	.0817	.0050	-.0214
2.2600	.3842	-.2928	-.2233	-.0625	-.0010	.0620	-.0426	-.0670
2.3800	.2654	-.3173	-.2761	-.0585	-.0236	.0395	-.1052	-.0567
2.5100	.1820	-.3006	-.3348	-.0564	-.0399	.0117	-.1466	-.0484
2.6300	.1203	-.2872	-.3877	-.0900	-.0616	-.0083	-.1794	-.0512
2.7600	.0494	-.2701	-.4096	-.1358	-.0975	-.0427	-.2197	-.0848

TABLE 4

MEAN CP VERSUS XB/R FOR VARYING PHI

XN/R= -1.0   H/R= .3   ADVANCE RATIO= .20

PHI=	0	45	90	135	180	225	270	315
XB/R	CP	CP	CP	CP	CP	CP	CP	CP
0.0000	.9803	.9842	.9741	.9861	.9861	.9865	.9846	.9817
.0100	.8220	.8341	.8498	.8609	.8604	.8511	.8321	.8214
.0200	.4518	.4681	.4953	.5027	.5008	.4832	.4601	.4490
.0400	.0148	.0254	.0420	.0341	.0286	.0072	-.0037	.0004
.0800	-.3222	-.3379	-.3596	-.3933	-.4096	-.4241	-.4128	-.3687
.1100	-.3251	-.3401	-.3551	-.3931	-.4097	-.4228	-.4100	-.3681
.1600	-.2294	-.2657	-.3106	-.3686	-.3946	-.4005	-.3741	-.3128
.2000	.1056	.0923	.0398	-.0349	-.0627	-.0491	-.0002	.0556
.2400	.1524	.1228	.0591	.0042	-.0181	-.0109	.0249	.0857
.2800	.1823	.1525	.0886	.0335	.0127	.0196	.0532	.1142
.3300	.2001	.1704	.1079	.0533	.0326	.0389	.0720	.1301
.3700	.2085	.1816	.1210	.0692	.0480	.0536	.0851	.1387
.4100	.2109	.1852	.1286	.0788	.0576	.0638	.0923	.1407
.4500	.2092	.1869	.1349	.0889	.0685	.0738	.0982	.1398
.4900	.1966	.1808	.1336	.0919	.0727	.0767	.0953	.1291
.5300	.1832	.1721	.1307	.0951	.0776	.0802	.0946	.1196
.5800	.1646	.1588	.1247	.0942	.0793	.0808	.0891	.1020
.6200	.1470	.1480	.1202	.0960	.0822	.0819	.0837	.0835
.6600	.1277	.1351	.1141	.0962	.0840	.0819	.0770	.0655
.7000	.1079	.1290	.1088	.0957	.0852	.0809	.0690	.0453
.7400	.0883	.1167	.1045	.0954	.0868	.0802	.0628	.0259
.8000	.0562	.1044	.0994	.0942	.0871	.0785	.0532	.0002
.8400	.0249	.0906	.0938	.0919	.0856	.0757	.0457	-.0219
.8800	-.0173	.0756	.0894	.0900	.0850	.0740	.0402	-.0414
.9200	-.0727	.0661	.0915	.0920	.0884	.0768	.0406	-.0535
.9600	-.1617	.0485	.0885	.0899	.0859	.0745	.0363	-.0708
1.0100	-.2492	.0409	.0898	.0905	.0860	.0749	.0380	-.0720
1.0500	-.2514	.0456	.0957	.0934	.0894	.0784	.0449	-.0563
1.0900	-.1936	.0438	.0971	.0912	.0873	.0779	.0472	-.0415
1.1300	-.1207	.0495	.1060	.0946	.0902	.0827	.0583	-.0149
1.1700	-.0460	.0473	.1122	.0956	.0907	.0851	.0670	.0060
1.2100	.0170	.0608	.1173	.0955	.0909	.0876	.0751	.0244
1.2600	.0676	.1204	.1237	.0966	.0924	.0913	.0847	.0399
1.3000	.1030	.1851	.1258	.0966	.0931	.0942	.0930	.0571
1.3400	.1319	.2223	.1262	.0972	.0942	.0973	.1007	.0737
1.3800	.1533	.2412	.1177	.0966	.0956	.1003	.1076	.0883

TABLE 4 CONTINUED

PHI=	0	45	90	135	180	225	270	315
XB/R	CP	CP	CP	CP	CP	CP	CP	CP
1.4200	.1709	.2542	.0975	.0928	.0943	.1012	.1106	.0931
1.4600	.1829	.2623	.0698	.0898	.0942	.1026	.1136	.1007
1.5100	.1987	.2754	.0497	.0883	.0954	.1056	.1182	.1165
1.5500	.2053	.2738	.0360	.0786	.0924	.1034	.1155	.1238
1.5900	.2131	.2738	.0610	.0712	.0911	.1034	.1150	.1305
1.6300	.2164	.2675	.0811	.0623	.0880	.1011	.1120	.1308
1.6700	.2207	.2632	.0885	.0547	.0852	.0987	.1082	.1316
1.7100	.2109	.2402	.0777	.0401	.0788	.0924	.0983	.1203
1.7600	.2199	.2435	.0835	.0374	.0789	.0924	.0974	.1198
1.8800	.1922	.1904	.0492	.0100	.0643	.0769	.0695	.0767
2.0100	.1426	.1178	.0071	-.0071	.0494	.0612	.0393	.0216
2.1300	.1023	.0388	-.0339	-.0236	.0323	.0440	.0132	-.0270
2.2600	.0862	-.0263	-.0664	-.0388	.0149	.0280	-.0032	-.0605
2.3800	.0579	-.0699	-.0875	-.0450	-.0001	.0154	-.0133	-.0714
2.5100	.0311	-.1008	-.1112	-.0512	-.0138	.0027	-.0202	-.0397
2.6300	.0051	-.1224	-.1366	-.0570	-.0314	-.0133	-.0270	-.0267
2.7600	-.0294	-.1515	-.1717	-.0813	-.0647	-.0458	-.0589	-.0501

TABLE 5

MEAN CP VERSUS XB/R FOR VARYING PHI

XN/R= -1.0   H/R= .5   ADVANCE RATIO= .10

PHI=	0	45	90	135	180	225	270	315
XB/R	CP	CP	CP	CP	CP	CP	CP	CP
0.0000	.9670	.9638	.9675	.9779	.9634	.9671	.9671	.9632
.0100	.7865	.8070	.8512	.8266	.9024	.8865	.8469	.8005
.0200	.4585	.4895	.5559	.4353	.6246	.6018	.5424	.4816
.0400	.1269	.1429	.1894	-.0749	.2355	.2106	.1674	.1328
.0800	-.0694	-.0915	-.1103	-.5363	-.1326	-.1473	-.1414	-.1052
.1100	-.0799	-.0982	-.1134	-.5345	-.1353	-.1536	-.1341	-.1114
.1600	.0413	.0115	-.0323	-.4890	-.1084	-.0976	-.0687	-.0118
.2000	.4054	.3270	-.0207	-.4090	-.0686	-.0889	-.0360	.2847
.2400	.4382	.3892	.3028	-.0930	.1811	.2084	.2706	.3603
.2800	.4546	.4024	.3089	-.0922	.1943	.2141	.2767	.3695
.3300	.4616	.4104	.3203	-.0820	.2082	.2250	.2843	.3737
.3700	.4616	.4154	.3295	-.0704	.2238	.2379	.2909	.3722
.4100	.4565	.4143	.3352	-.0627	.2348	.2477	.2972	.3660
.4500	.4480	.4145	.3410	-.0544	.2472	.2594	.2984	.3581
.4900	.4383	.4110	.3434	-.0507	.2554	.2660	.2976	.3462
.5300	.4310	.4085	.3453	-.0451	.2641	.2727	.2971	.3372
.5800	.4233	.4088	.3468	-.0440	.2705	.2767	.2939	.3270
.6200	.4200	.4133	.3508	-.0409	.2777	.2816	.2926	.3195
.6600	.4170	.4217	.3537	-.0387	.2843	.2853	.2905	.3139
.7000	.4122	.4331	.3586	-.0368	.2893	.2884	.2891	.3051
.7400	.3906	.4441	.3624	-.0347	.2954	.2915	.2888	.2966
.8000	.2324	.4324	.3653	-.0340	.2998	.2947	.2864	.2774
.8400	-.0887	.3447	.3624	-.0356	.3020	.2962	.2847	.2384
.8800	.7298	-.0373	.3515	-.0363	.3043	.2978	.2810	.1418
.9200	.8530	-.1845	.3195	-.0330	.3070	.3009	.2785	-.1218
.9600	.7410	.3938	.2452	-.0347	.3069	.2998	.2684	-.4517
1.0100	.6305	.6611	.1017	-.0354	.3049	.2997	.2512	-.3901
1.0500	.5819	.7229	-.1014	-.0327	.3044	.2993	.2256	-.2213
1.0900	.5324	.7122	-.2659	-.0344	.3002	.2969	.1663	-.0963
1.1300	.5353	.7181	-.1884	-.0301	.2975	.2951	.0603	.0176
1.1700	.5306	.7142	-.1089	-.0321	.2936	.2908	-.0171	.0775
1.2100	.5390	.7110	-.0380	-.0321	.2874	.2862	-.0500	.1250
1.2600	.5507	.7138	.0321	-.0316	.2798	.2784	-.1042	.1667
1.3000	.5556	.7178	.0604	-.0315	.2729	.2720	-.2110	.1956
1.3400	.5615	.7181	.0900	-.0318	.2632	.2634	-.1198	.2219
1.3800	.5662	.7173	.1092	-.0304	.2559	.2507	-.0021	.2412

TABLE 5 CONTINUED

PHI=	0	45	90	135	180	225	270	315
XB/R	CP	CP	CP	CP	CP	CP	CP	CP
1.4200	.5688	.7055	.1035	-.0320	.2425	.2358	.0689	.2623
1.4600	.5716	.6945	.1007	-.0313	.2301	.2191	.1134	.2753
1.5100	.5831	.6867	.0963	-.0287	.2197	.2021	.1525	.2890
1.5500	.5824	.6599	.0587	-.0307	.1999	.1790	.1813	.2860
1.5900	.5833	.6367	.0353	-.0303	.1834	.1658	.2191	.2798
1.6300	.5790	.5977	.0045	-.0310	.1611	.1537	.2388	.2679
1.6700	.5826	.5466	-.0350	-.0308	.1379	.1468	.2530	.2658
1.7100	.5888	.4788	-.0911	-.0339	.1109	.1446	.2384	.2406
1.7600	.5941	.4384	-.1146	-.0292	.0961	.1419	.2398	.2490
1.8800	.5988	.1907	-.2811	-.0306	.0341	.1438	.1838	.2110
2.0100	.6029	-.0564	-.4719	-.0294	-.0150	.1440	.1147	.1669
2.1300	.7749	-.2633	-.6038	-.0316	-.0692	.1234	.0310	.1091
2.2600	.8704	-.5184	-.6269	-.0340	-.1092	.0917	-.0554	.0339
2.3800	.8760	-.7913	-.6955	-.0353	-.1270	.0658	-.1629	-.0230
2.5100	.6810	-.8844	-.8593	-.0376	-.1186	.0398	-.3625	.1106
2.6300	.5031	-.8553	-.9410	-.0436	-.1165	-.0121	-.5172	.0450
2.7600	.3085	-.7269	-.9174	-.0602	-.1418	-.0734	-.6553	-.0899

TABLE 6

MEAN CP VERSUS XB/R FOR VARYING PHI

XN/R= -1.0   H/R= .5   ADVANCE RATIO= .20

PHI=	0	45	90	135	180	225	270	315
XB/R	CP	CP	CP	CP	CP	CP	CP	CP
0.0000	.9874	.4566	.9855	.9857	.9843	.9833	.9863	.9858
.0100	.8283	.0036	.8528	.8385	.8531	.8408	.8260	.8242
.0200	.4570	-.3909	.4903	.4424	.4855	.4627	.4424	.4467
.0400	.0014	-.3929	.0189	-.0727	.0076	-.0184	-.0377	-.0207
.0800	-.3906	-.3352	-.4083	-.5495	-.4363	-.4538	-.4589	-.4268
.1100	-.3989	.0156	-.4073	-.5494	-.4336	-.4568	-.4489	-.4252
.1600	-.3340	.0390	-.3686	-.5291	-.4193	-.4313	-.4218	-.3848
.2000	.0222	.0691	-.0269	-.1756	-.0860	-.0829	-.0449	-.0078
.2400	.0532	.0891	.0031	-.1304	-.0427	-.0405	-.0159	.0204
.2800	.0850	.1032	.0316	-.1009	-.0134	-.0100	.0133	.0518
.3300	.1050	.1124	.0511	-.0828	.0060	.0104	.0331	.0712
.3700	.1196	.1213	.0667	-.0680	.0213	.0254	.0477	.0844
.4100	.1282	.1230	.0767	-.0586	.0310	.0360	.0574	.0930
.4500	.1365	.1238	.0877	-.0481	.0422	.0470	.0676	.1005
.4900	.1361	.1210	.0907	-.0450	.0468	.0514	.0693	.0997
.5300	.1363	.1201	.0943	-.0397	.0524	.0568	.0725	.0999
.5800	.1307	.1167	.0939	-.0392	.0541	.0583	.0720	.0968
.6200	.1271	.1169	.0960	-.0351	.0583	.0620	.0733	.0931
.6600	.1211	.1114	.0957	-.0336	.0607	.0638	.0734	.0884
.7000	.1146	.1069	.0988	-.0319	.0634	.0655	.0718	.0830
.7400	.1080	.1017	.0961	-.0297	.0663	.0675	.0715	.0775
.8000	.0977	.0982	.0953	-.0286	.0682	.0684	.0696	.0704
.8400	.0879	.1005	.0927	-.0301	.0677	.0676	.0664	.0628
.8800	.0811	.0968	.0914	-.0301	.0683	.0673	.0650	.0587
.9200	.0800	.0977	.0943	-.0257	.0723	.0714	.0681	.0598
.9600	.0720	.1040	.0917	-.0290	.0704	.0692	.0652	.0547
1.0100	.0707	.1037	.0925	-.0292	.0710	.0698	.0656	.0547
1.0500	.0761	.1122	.0962	-.0252	.0741	.0733	.0691	.0609
1.0900	.0752	.1181	.0932	-.0297	.0714	.0713	.0680	.0615
1.1300	.0862	.1238	.0973	-.0260	.0745	.0744	.0726	.0692
1.1700	.0946	.1306	.0994	-.0262	.0748	.0752	.0749	.0752
1.2100	.1026	.1367	.0998	-.0275	.0743	.0755	.0766	.0814
1.2600	.1134	.1434	.1021	-.0272	.0754	.0770	.0806	.0888
1.3000	.1231	.1494	.1032	-.0263	.0755	.0782	.0833	.0955
1.3400	.1326	.1509	.1048	-.0258	.0762	.0796	.0856	.1022
1.3800	.1417	.1544	.1061	-.0244	.0770	.0809	.0879	.1081

TABLE 6 CONTINUED

PHI=	0	45	90	135	180	225	270	315
XB/R	CP	CP	CP	CP	CP	CP	CP	CP
1.4200	.1485	.1610	.1042	-.0264	.0759	.0800	.0881	.1108
1.4600	.1551	.1578	.1033	-.0260	.0759	.0803	.0888	.1137
1.5100	.1641	.1594	.1056	-.0217	.0781	.0827	.0911	.1171
1.5500	.1639	.1567	.0994	-.0248	.0752	.0803	.0882	.1145
1.5900	.1663	.1539	.0975	-.0236	.0756	.0806	.0870	.1134
1.6300	.1641	.1396	.0928	-.0250	.0736	.0780	.0833	.1081
1.6700	.1607	.1447	.0874	-.0244	.0720	.0768	.0803	.1045
1.7100	.1467	.1228	.0763	-.0302	.0670	.0714	.0725	.0920
1.7600	.1451	.0981	.0771	-.0231	.0691	.0730	.0723	.0915
1.8800	.1127	.0676	.0544	-.0250	.0616	.0640	.0546	.0603
2.0100	.0802	.0525	.0316	-.0233	.0544	.0551	.0373	.0270
2.1300	.0401	.0497	.0083	-.0252	.0437	.0434	.0193	-.0044
2.2600	.0078	.0381	-.0145	-.0275	.0328	.0310	.0022	-.0278
2.3800	-.0066	.0174	-.0367	-.0291	.0225	.0205	-.0116	-.0478
2.5100	-.0137	-.0166	-.0674	-.0305	.0112	.0089	-.0210	-.0645
2.6300	-.0271	.1007	-.0782	-.0355	-.0047	-.0070	-.0352	-.0827
2.7600	-.0478	.0778	-.0828	-.0517	-.0381	-.0384	-.0658	-.1071

TABLE 7

MEAN CP VERSUS XB/R FOR VARYING PHI

XN/R= -.6   H/R= .3   ADVANCE RATIO= .10

PHI=	0	90	180	270
XB/R	CP	CP	CP	CP
0.0000	.9067	.9141	.9096	.9126
.0100	.9603	.8400	.7540	.8007
.0200	.9556	.6200	.4934	.5334
.0400	.9138	.3400	.1789	.2071
.0800	.2488	.1028	-.0813	-.0761
.1100	.3039	.1031	-.0792	-.0732
.1600	.6873	.0753	-.0042	-.0396
.2000	.5756	-.1520	-.0188	.0468
.2400	.4952	-.2535	.2670	.0054
.2800	.4219	-.1922	.2790	-.1680
.3300	.3523	-.1161	.2837	-.3173
.3700	.2955	-.0279	.2872	-.2020
.4100	.2381	.0250	.2871	.0052
.4500	.1966	.0742	.2861	.1026
.4900	.1314	.1246	.2827	.1506
.5300	.0801	.1599	.2777	.1939
.5800	.0180	.1988	.2695	.2131
.6200	.0124	.2360	.2643	.2304
.6600	.0817	.2592	.2565	.2497
.7000	.1918	.2781	.2487	.2641
.7400	.3090	.2918	.2447	.2801
.8000	.4365	.3027	.2328	.3010
.8400	.5078	.2991	.2237	.3179
.8800	.5751	.2904	.2126	.3365
.9200	.6312	.2930	.2046	.3617
.9600	.6661	.2765	.1882	.3680
1.0100	.7059	.2578	.1785	.3720
1.0500	.7512	.2380	.1743	.3763
1.0900	.7934	.1956	.1675	.3647
1.1300	.8516	.1520	.1576	.3566
1.1700	.9118	.0958	.1468	.3380
1.2100	.9804	.0445	.1341	.3148
1.2600	1.0559	-.0258	.1210	.2839
1.3000	1.1470	-.1143	.1008	.2442
1.3400	1.2482	-.1949	.0858	.1998
1.3800	1.3464	-.2809	.0807	.1513

TABLE 7 CONTINUED

PHI=	0	90	180	270
XB/R	CP	CP	CP	CP
1.4200	1.4491	-.3711	.0583	.0989
1.4600	1.5541	-.4664	.0407	.0408
1.5100	1.7056	-.5349	.0307	-.0403
1.5500	1.8222	-.6475	.0174	-.2153
1.5900	1.8301	-.7860	.0067	-.4861
1.6300	1.6897	-.9703	-.0021	-.7729
1.6700	1.4993	-1.1334	-.0112	-.9862
1.7100	1.2915	-1.3483	-.0347	-1.1772
1.7600	1.1460	-1.4519	-.0323	-1.2257
1.8800	.6763	-1.5833	-.0777	-1.2694
2.0100	.4361	-1.4937	-.1274	-1.2672
2.1300	.3197	-1.2893	-.1674	-1.2831
2.2600	.2152	-.9063	-.2125	-1.3769
2.3800	.1613	-.7576	-.2353	-.8125
2.5100	.1137	-.6569	-.2166	-.6041
2.6300	.0774	-.5743	-.1682	-.5524
2.7600	.0257	-.5107	-.1266	-.5097

TABLE 8

MEAN CP VERSUS XB/R FOR VARYING PHI

XN/R= −.6   H/R= .3   ADVANCE RATIO= .20

PHI=	0	90	180	270
XB/R	CP	CP	CP	CP
0.0000	.9770	.9639	.9717	.9579
.0100	.9073	.8601	.8101	.8062
.0200	.6532	.5378	.4410	.4545
.0400	.3113	.1159	−.0135	.0116
.0800	−.0398	−.2752	−.4258	−.3803
.1100	−.0391	−.2731	−.4270	−.3793
.1600	−.0909	−.2553	−.3895	−.3462
.2000	.0274	.0284	−.0374	−.0076
.2400	.0647	.0434	−.0069	−.0013
.2800	.0682	.0580	.0179	.0134
.3300	.0618	.0663	.0358	.0212
.3700	.0509	.0711	.0477	.0259
.4100	.0345	.0720	.0557	.0265
.4500	.0111	.0773	.0653	.0290
.4900	−.0325	.0772	.0681	.0261
.5300	−.0860	.0779	.0721	.0286
.5800	−.1538	.0790	.0730	.0286
.6200	−.2036	.0835	.0774	.0341
.6600	−.2131	.0880	.0798	.0409
.7000	−.1535	.0953	.0828	.0502
.7400	−.0672	.1022	.0856	.0609
.8000	.0146	.1124	.0891	.0756
.8400	.0614	.1173	.0902	.0858
.8800	.1029	.1200	.0915	.0961
.9200	.1404	.1239	.0963	.1087
.9600	.1592	.1214	.0959	.1147
1.0100	.1762	.1238	.0977	.1211
1.0500	.1951	.1251	.1003	.1291
1.0900	.2025	.1157	.0978	.1305
1.1300	.2144	.1087	.0998	.1337
1.1700	.2225	.0984	.1001	.1332
1.2100	.2279	.0888	.0977	.1307
1.2600	.2352	.0863	.0966	.1269
1.3000	.2406	.0808	.0937	.1211
1.3400	.2430	.0789	.0920	.1137
1.3800	.2369	.0766	.0896	.1041

TABLE 8 CONTINUED

PHI=	0	90	180 ·	270
XB/R	CP	CP	CP	CP
1.4200	.2397	.0641	.0843	.0937
1.4600	.2336	.0539	.0808	.0825
1.5100	.2281	.0463	.0786	.0740
1.5500	.2086	.0238	.0725	.0598
1.5900	.1941	.0115	.0680	.0500
1.6300	.1752	-.0037	.0623	.0385
1.6700	.1643	-.0179	.0573	.0305
1.7100	.1418	-.0404	.0491	.0180
1.7600	.1460	-.0387	.0477	.0183
1.8800	.1116	-.0645	.0329	.0023
2.0100	.0761	-.0822	.0216	-.0094
2.1300	.0484	-.1075	.0106	-.0137
2.2600	.0282	-.1328	.0007	-.0227
2.3800	.0150	-.1457	-.0053	-.0357
2.5100	.0037	-.1513	-.0093	-.0435
2.6300	-.0098	-.1496	-.0125	-.0505
2.7600	-.0399	-.1594	-.0306	-.0767

TABLE 9

MEAN CP VERSUS XB/R FOR VARYING PHI

XN/R= -.6   H/R= .5   ADVANCE RATIO= .10

PHI=	0	90	180	270
XB/R	CP	CP	CP	CP
0.0000	.9592	.9634	.9637	.9626
.0100	.9178	.8685	.8280	.8451
.0200	.7481	.6160	.5453	.5700
.0400	.5127	.2899	.1970	.2251
.0800	.2722	.0149	-.1039	-.0750
.1100	.2718	.0073	-.0965	-.0859
.1600	.2498	.0730	-.0394	-.0189
.2000	.3341	.1833	-.0516	.1101
.2400	.3786	.3170	.2253	.2501
.2800	.3944	.3205	.2522	.2520
.3300	.4020	.3298	.2602	.2578
.3700	.3644	.3408	.2672	.2662
.4100	.2381	.3449	.2760	.2708
.4500	-.0088	.3466	.2852	.2732
.4900	.2187	.3409	.2894	.2725
.5300	.6138	.3164	.2939	.2727
.5800	.6375	.2677	.2974	.2663
.6200	.5928	.2017	.2982	.2537
.6600	.5559	.1059	.2999	.2296
.7000	.5337	.0015	.3007	.1757
.7400	.5261	-.0555	.2985	.1088
.8000	.5278	-.0486	.2929	.0448
.8400	.5308	-.0043	.2884	.0119
.8800	.5411	.0543	.2842	-.0410
.9200	.5562	.0917	.2824	-.0315
.9600	.5575	.1037	.2735	.0154
1.0100	.5613	.1081	.2668	.0685
1.0500	.5756	.1081	.2591	.1267
1.0900	.5759	.0777	.2489	.1484
1.1300	.5852	.0572	.2401	.1848
1.1700	.5869	.0338	.2281	.1951
1.2100	.5857	.0026	.2134	.2179
1.2600	.5840	-.0258	.1963	.2260
1.3000	.5790	-.0653	.1785	.2192
1.3400	.5784	-.1081	.1629	.2010
1.3800	.5816	-.1499	.1423	.1862

TABLE 9 CONTINUED

PHI=	0	90	180	270
XB/R	CP	CP	CP	CP
1.4200	.5902	-.2129	.1220	.1627
1.4600	.6090	-.2648	.1014	.1405
1.5100	.6414	-.3120	.0833	.1197
1.5500	.6635	-.3733	.0625	.0924
1.5900	.6979	-.4247	.0383	.0662
1.6300	.7338	-.4842	.0162	.0369
1.6700	.7722	-.5393	-.0020	.0125
1.7100	.8047	-.5817	-.0276	-.0210
1.7600	.8517	-.5849	-.0452	-.0461
1.8800	.9507	-.6043	-.0994	-.1526
2.0100	.9056	-.7385	-.1268	-.3370
2.1300	.7132	-.8556	-.1266	-.5257
2.2600	.5198	-.8960	-.1289	-.6946
2.3800	.3852	-.7867	-.1337	-.7938
2.5100	.2841	-.6764	-.1146	-.8213
2.6300	.2025	-.5603	-.0928	-.8252
2.7600	.1102	-.4736	-.0630	-.6195

TABLE 10

MEAN CP VERSUS XB/R FOR VARYING PHI

XN/R= -.6   H/R= .5   ADVANCE RATIO= .20

PHI=	0	90	180	270
XB/R	CP	CP	CP	CP
0.0000	.9715	.9716	.9671	.9776
.0100	.8652	.8484	.8084	.8230
.0200	.5557	.5058	.4540	.4496
.0400	.1529	.0597	-.0058	-.0132
.0800	-.2313	-.3462	-.4281	-.4217
.1100	-.2342	-.3424	-.4265	-.4232
.1600	-.2118	-.3227	-.3989	-.3876
.2000	-.0082	.0022	-.0584	-.0180
.2400	.0476	.0171	-.0252	-.0087
.2800	.0634	.0374	.0002	.0123
.3300	.0693	.0511	.0181	.0267
.3700	.0708	.0615	.0314	.0369
.4100	.0704	.0670	.0402	.0428
.4500	.0722	.0751	.0504	.0508
.4900	.0664	.0774	.0540	.0519
.5300	.0669	.0803	.0597	.0570
.5800	.0654	.0812	.0604	.0570
.6200	.0679	.0846	.0647	.0611
.6600	.0726	.0872	.0671	.0642
.7000	.0801	.0906	.0694	.0672
.7400	.0887	.0939	.0716	.0715
.8000	.1023	.0975	.0738	.0760
.8400	.1115	.0982	.0739	.0788
.8800	.1219	.0998	.0746	.0819
.9200	.1360	.1049	.0790	.0887
.9600	.1419	.1035	.0771	.0884
1.0100	.1502	.1044	.0784	.0905
1.0500	.1606	.1074	.0806	.0941
1.0900	.1626	.1029	.0784	.0926
1.1300	.1692	.1040	.0807	.0944
1.1700	.1711	.1016	.0798	.0927
1.2100	.1696	.0971	.0783	.0904
1.2600	.1692	.0940	.0774	.0884
1.3000	.1661	.0892	.0765	.0850
1.3400	.1614	.0853	.0757	.0812
1.3800	.1552	.0800	.0749	.0770

TABLE 10 CONTINUED

PHI=	0	90	180	270
XB/R	CP	CP	CP	CP
1.4200	.1453	.0717	.0718	.0704
1.4600	.1373	.0659	.0701	.0644
1.5100	.1321	.0627	.0701	.0616
1.5500	.1178	.0514	.0662	.0534
1.5900	.1077	.0461	.0646	.0484
1.6300	.0947	.0378	.0616	.0413
1.6700	.0838	.0295	.0590	.0363
1.7100	.0648	.0171	.0533	.0264
1.7600	.0629	.0174	.0553	.0265
1.8800	.0354	-.0014	.0461	.0136
2.0100	.0199	-.0148	.0400	.0063
2.1300	.0081	-.0295	.0327	-.0002
2.2600	.0011	-.0511	.0260	-.0060
2.3800	.0001	-.0687	.0212	-.0108
2.5100	.0051	-.0660	.0154	-.0184
2.6300	.0078	-.0600	.0091	-.0306
2.7600	-.0081	-.0862	-.0154	-.0582

TABLE 11

UNSTEADY PRESSURE COEFFICIENT VERSUS BLADE AZIMUTH ANGLE

XN/R	H/R	PHI	XB1/R	XB2/R	XB3/R	XB4/R
-1.	.3	0	.62	1.21	1.71	2.26

	ADVANCE RATIO=.075 q= .26				ADVANCE RATIO= .10 q= .47			
AZ	CP1	CP2	CP3	CP4	CP1	CP2	CP3	CP4
6	.0885	.8340	2.5979	-1.3019	.0331	.7517	1.9723	.5683
12	-.3011	.6453	2.1732	-1.7465	-.0983	.6082	1.6007	.6657
18	-.1710	.4796	1.9337	-1.9649	-.0251	.4600	1.1572	.7415
24	.2122	.3034	1.7463	-1.7893	.1803	.3530	.9298	.7865
30	.5218	.1576	1.4603	-1.0179	.3038	.2722	.6340	.7456
36	.5149	.0353	1.0812	.1172	.2292	.1309	.2799	.6435
42	.3369	-.0750	.7133	1.1170	.1091	-.0011	-.0131	.5282
48	.0997	-.2028	.3857	1.6591	.0077	-.1135	-.2521	.3957
54	-.0931	-.2773	.1172	1.8107	-.0884	-.2210	-.4087	.2839
60	-.2203	-.3247	-.1025	1.6884	-.1532	-.2768	-.4737	.2138
66	-.3265	-.3698	-.3047	1.4832	-.2410	-.3396	-.5379	.1366
72	-.3870	-.4338	-.5162	1.2088	-.3126	-.3959	-.5921	.0660
78	-.4487	-.5017	-.7383	.9214	-.3664	-.4288	-.6309	-.0004
84	-.4493	-.5121	-.8901	.6796	-.5787	-.4487	-.6576	-.0596
90	-.4312	-.4966	-1.0215	.4928	-.9516	-.4607	-.6773	-.1111
96	-.4361	-.5090	-1.1684	.3416	-.6159	-.4730	-.7006	-.1542
102	-.4580	-.5025	-1.3251	.1868	-.1584	-.4938	-.7412	-.2107
108	-.5033	-.4630	-1.4354	.0670	.1063	-.4806	-.7475	-.2432
114	-.8022	-.4520	-1.5249	-.0167	.1379	-.4837	-.7756	-.2921
120	-1.4704	-.4296	-1.5925	-.0845	.0993	-.4899	-.7995	-.3402
126	-.8754	-.3570	-1.6252	-.1468	.0659	-.4467	-.8026	-.3863
132	-.0394	-.2346	-1.5696	-.1557	.0575	-.3393	-.7642	-.4281
138	.1993	-.1415	-1.5044	-.1997	.0604	-.2159	-.7165	-.4712
144	.4069	-.0508	-1.4044	-.2560	.0816	-.1071	-.6562	-.5320
150	.6212	.1007	-1.1703	-.2449	.1505	.0461	-.5078	-.5398
156	.8352	.2728	-.7486	-.2247	.2443	.2333	-.2516	-.5105
162	1.0083	.5166	-.1380	-.2032	.3557	.4393	.1540	-.4004
168	1.0320	.7003	.6601	-.2534	.4271	.6551	.7264	-.2196
174	.8780	.8669	1.7211	-.3598	.3972	.8576	1.4530	.0131
180	.4097	.9916	2.7561	-.5681	.2000	.9084	2.0899	.2432
186	-.2238	.9326	3.1145	-.9350	-.0948	.8475	2.3073	.4102
192	-.5822	.7515	2.7123	-1.3598	-.2574	.6735	1.9524	.4664
198	-.3316	.5108	2.3230	-1.5729	-.1098	.5367	1.4768	.5728
204	.0791	.3209	2.0028	-1.5218	.1629	.4063	1.1329	.6475
210	.4315	.1971	1.6769	-1.1169	.2877	.3140	.8031	.6045
216	.4547	.1264	1.2593	-.3273	.2373	.1732	.4546	.5326

TABLE 11 CONTINUED

AZ	CP1	CP2	CP3	CP4	CP1	CP2	CP3	CP4
222	.2794	-.0170	.8100	.5665	.0970	.0231	.1196	.4379
228	.0588	-.1303	.4311	1.1813	-.0209	-.0913	-.1315	.3305
234	-.1458	-.2358	.1060	1.4671	-.1039	-.2017	-.3080	.2323
240	-.2739	-.3085	-.1439	1.4746	-.1711	-.2743	-.4092	.1723
246	-.3738	-.3501	-.3467	1.3264	-.2721	-.3399	-.5016	.1026
252	-.4480	-.4323	-.5528	1.1017	-.3428	-.3892	-.5762	.0354
258	-.5019	-.4987	-.7449	.8696	-.4002	-.4423	-.6484	-.0346
264	-.4927	-.5070	-.8984	.6548	-.5206	-.4581	-.6887	-.1046
270	-.4724	-.5040	-1.0221	.4785	-.8313	-.4754	-.7224	-.1573
276	-.4674	-.5233	-1.1604	.3237	-.7249	-.5011	-.7602	-.1972
282	-.4730	-.5383	-1.3114	.1527	-.2792	-.5203	-.8037	-.2428
288	-.4674	-.4985	-1.3979	.0379	.0156	-.5165	-.8223	-.2930
294	-.5435	-.4854	-1.4924	-.0625	.1072	-.5226	-.8466	-.3498
300	-.9870	-.4713	-1.5585	-.1379	.0890	-.5249	-.8702	-.4040
306	-1.4925	-.4184	-1.5861	-.2104	.0719	-.4690	-.8671	-.4484
312	-.5868	-.3078	-1.5425	-.2194	.0649	-.3714	-.8276	-.4936
318	.0779	-.2525	-1.4976	-.2736	.0852	-.2454	-.7673	-.5529
324	.3746	-.2092	-1.3947	-.3316	.1147	-.1492	-.7073	-.6282
330	.7234	-.0850	-1.1820	-.3407	.1881	-.0050	-.5691	-.6365
336	.9920	.0862	-.7859	-.3309	.2975	.1735	-.3295	-.6083
342	1.1932	.3814	-.2286	-.3317	.4216	.3700	.0445	-.4996
348	1.2643	.6054	.5068	-.3993	.5089	.5629	.5642	-.2891
354	1.1997	.7718	1.4307	-.5550	.5303	.7547	1.2275	-.0101
360	.8027	.8808	2.3478	-.8226	.3752	.8122	1.7970	.2852

TABLE 12

UNSTEADY PRESSURE COEFFICIENT VERSUS BLADE AZIMUTH ANGLE

XN/R	H/R	PHI	XB1/R	XB2/R	XB3/R	XB4/R
-1.	.3	45	.62	1.21	1.71	2.26

	ADVANCE RATIO= .075		q= .26		ADVANCE RATIO= .10		q= .47	
AZ	CP1	CP2	CP3	CP4	CP1	CP2	CP3	CP4
6	.3306	.4695	1.5481	.3460	.0662	.3184	1.2203	-.5920
12	.4436	.5171	1.6516	.0248	.1441	.3636	1.3549	-.7080
18	.4980	.5231	1.4327	-.4044	.1570	.3734	1.1698	-.7636
24	.3740	.5681	1.0703	-.7569	.0671	.4354	.9173	-.6515
30	.1679	.6159	.8621	-1.0892	-.0810	.5069	.7519	-.4154
36	-.0753	.5966	.6852	-1.5956	-.2274	.4636	.5592	-.1791
42	-.2667	.5269	.3521	-2.3868	-.3288	.3704	.3512	-.0085
48	-.4528	.4016	.0033	-3.0018	-.3999	.2757	.1099	.0831
54	-.5574	.3124	-.2917	-2.8290	-.4313	.1721	-.0861	.1604
60	-.6228	.2136	-.4669	-1.9934	-.4438	.0698	-.2157	.2446
66	-.6862	.1308	-.5285	-.9205	-.4527	-.0097	-.3046	.2991
72	-.7202	.0216	-.5989	-.0505	-.4637	-.1041	-.3909	.3078
78	-.7656	-.1084	-.6670	.4730	-.5008	-.1778	-.4680	.3116
84	-.7537	-.1859	-.6632	.7426	-.1741	-.2193	-.5161	.3189
90	-.7201	-.2471	-.6099	.8536	.4262	-.2506	-.5371	.3225
96	-.7251	-.3251	-.5794	.8794	.4446	-.2884	-.5529	.3184
102	-.7913	-.3448	-.5485	.8500	.3159	-.3208	-.5677	.2974
108	-1.1946	-.3726	-.5446	.8431	.1909	-.3359	-.5608	.2906
114	-.7681	-.4384	-.5853	.8307	.0532	-.3976	-.5673	.2757
120	.1700	-.5269	-.6287	.7831	-.0421	-.4482	-.5786	.2341
126	.3677	-.5302	-.6102	.7428	-.0474	-.4624	-.5692	.1839
132	.5066	-.5216	-.5750	.7518	-.0063	-.4346	-.5369	.1495
138	.7969	-.5197	-.5782	.7242	.0726	-.4021	-.5091	.1210
144	1.0135	-.5406	-.5936	.6726	.1468	-.3558	-.4799	.0656
150	1.0831	-.5076	-.5452	.6412	.2260	-.2521	-.4094	.0164
156	.9437	-.4782	-.4206	.6382	.2273	-.1432	-.3229	-.0491
162	.6487	-.3942	-.2334	.6672	.0982	-.0467	-.1739	-.1145
168	.2170	-.2454	.0584	.6659	-.0754	.0562	.0529	-.1723
174	-.0827	-.0381	.5221	.6633	-.1915	.1629	.3809	-.2319
180	-.0678	.2190	1.1596	.6651	-.1601	.2692	.8112	-.3009
186	.1531	.3955	1.7642	.5336	-.0328	.3501	1.2584	-.3991
192	.3838	.4915	2.0260	.2445	.0834	.3966	1.4968	-.5264
198	.4668	.4951	1.8023	-.1643	.1090	.4287	1.3851	-.6141
204	.3182	.5941	1.3762	-.5236	.0475	.4883	1.1151	-.5518
210	.1555	.6957	1.0653	-.7492	-.0564	.5659	.9271	-.3698
216	-.0772	.7364	.8156	-1.0857	-.1991	.5373	.6985	-.1544

TABLE 12 CONTINUED

AZ	CP1	CP2	CP3	CP4	CP1	CP2	CP3	CP4
222	-.2688	.6815	.4935	-1.7065	-.3072	.4413	.4353	.0039
228	-.4517	.5544	.1252	-2.3181	-.3847	.3305	.1788	.0990
234	-.5650	.4100	-.2018	-2.4639	-.4033	.2317	-.0340	.1948
240	-.6370	.2827	-.3809	-1.9494	-.3992	.1276	-.1788	.2672
246	-.6906	.1893	-.4689	-1.0341	-.3989	.0290	-.2965	.3060
252	-.7384	.0448	-.5478	-.2545	-.3823	-.0650	-.3868	.3136
258	-.7819	-.0717	-.6278	.2443	-.3848	-.1298	-.4589	.3064
264	-.7745	-.1588	-.6510	.5791	-.1288	-.1826	-.5122	.3129
270	-.7409	-.2221	-.6285	.7523	.2977	-.2235	-.5393	.3195
276	-.7339	-.3098	-.6230	.8466	.3852	-.2744	-.5592	.3182
282	-.7476	-.3532	-.6189	.8514	.3495	-.3038	-.5761	.2922
288	-1.0904	-.3850	-.5935	.8782	.2284	-.3168	-.5687	.2811
294	-1.0403	-.4503	-.6129	.8585	.1053	-.3643	-.5877	.2582
300	-.0809	-.5400	-.6719	.8023	.0222	-.4270	-.5992	.2326
306	.3910	-.5474	-.6794	.7341	.0252	-.4377	-.5962	.1899
312	.5836	-.5231	-.6440	.7223	.0735	-.4300	-.5664	.1544
318	.9374	-.5240	-.6277	.6798	.1988	-.3783	-.5320	.1088
324	1.2483	-.5417	-.6246	.6328	.3035	-.3296	-.5076	.0416
330	1.4203	-.5348	-.5834	.6061	.3833	-.2648	-.4399	-.0212
336	1.3151	-.5206	-.4750	.6007	.4100	-.1729	-.3494	-.1093
342	1.0293	-.3778	-.2914	.5976	.3031	-.0915	-.2028	-.1919
348	.6031	-.1804	.0171	.6042	.1423	.0114	.0197	-.2698
354	.2923	.0225	.4099	.5701	-.0239	.1255	.3369	-.3552
360	.1627	.2454	.9095	.5177	-.0398	.2239	.7337	-.4265

TABLE 13

UNSTEADY PRESSURE COEFFICIENT VERSUS BLADE AZIMUTH ANGLE

XN/R	H/R	PHI	XB1/R	XB2/R	XB3/R	XB4/R
-1.	.3	90	.62	1.21	1.71	2.26

		ADVANCE RATIO= .075	q= .26			ADVANCE RATIO= .10	q= .47	
AZ	CP1	CP2	CP3	CP4	CP1	CP2	CP3	CP4
6	-.3508	.1140	1.0185	1.0927	.5768	.0333	.5790	.3181
12	-.3334	.2161	1.2240	1.1244	.5282	.0884	.7549	.2428
18	-.3006	.2517	1.1753	1.0333	.4712	.1105	.7807	.1131
24	-.2943	.3759	1.0431	.9809	.4007	.1940	.7274	.0097
30	-.2464	.4856	.8639	1.0140	.3500	.2806	.6330	-.0058
36	-.2163	.4942	.6459	.9652	.3015	.2967	.5036	.0048
42	-.1317	.5005	.4469	.8770	.2881	.2885	.3686	-.0316
48	-.1359	.4243	.1897	.6816	.2399	.2506	.2094	-.1545
54	-.1126	.3447	-.0180	.5210	.2063	.2016	.0601	-.2841
60	-.0532	.2875	-.1902	.4681	.2082	.1639	-.0399	-.3118
66	-.0144	.2049	-.3071	.4055	.2154	.1293	-.1140	-.3422
72	.0149	.1323	-.3840	.1964	.2213	.0720	-.1879	-.3764
78	.0131	.0377	-.4842	-.0900	.2306	.0156	-.2573	-.3711
84	.0340	-.0422	-.5623	-.3817	.2554	-.0084	-.2903	-.3328
90	-.0088	-.1424	-.5854	-.7268	.2182	-.0644	-.3292	-.3128
96	-.0340	-.2068	-.6156	-1.0844	.1476	-.1163	-.3551	-.2835
102	.0231	-.1761	-.5692	-1.4318	.0666	-.0945	-.3222	-.2117
108	-.0312	-.1949	-.5585	-1.6926	-.0598	-.1148	-.3077	-.1327
114	-.1691	-.2825	-.6030	-1.8059	-.1909	-.1694	-.3311	-.0923
120	-.2502	-.3317	-.6378	-1.6984	-.2349	-.2085	-.3547	-.0684
126	.1466	-.3537	-.6028	-1.3119	-.3706	-.2380	-.3458	-.0181
132	.6987	-.3678	-.5416	-.8735	-.5963	-.2384	-.3224	.0344
138	.9214	-.3841	-.4917	-.4967	-.8852	-.2216	-.3120	.0722
144	.8071	-.3797	-.4433	-.1914	-1.4455	-.1926	-.3034	.0981
150	.5995	-.3730	-.3703	.1051	-1.8100	-.1427	-.2847	.1381
156	.2927	-.4097	-.3238	.3026	-1.6754	-.1221	-.2796	.1554
162	.0285	-.3691	-.2466	.4807	-.2893	-.1214	-.2290	.1790
168	-.1140	-.2298	-.0815	.6498	.4284	-.1081	-.1061	.2262
174	-.1564	-.1255	.1197	.7783	.6611	-.0971	.0523	.2576
180	-.1721	-.0322	.3961	.9234	.7166	-.0658	.2447	.2801
186	-.1959	.0460	.6941	1.0218	.6737	-.0282	.4495	.2535
192	-.2244	.1081	.8953	1.0602	.6062	.0238	.6209	.1682
198	-.2855	.0795	.7888	.9246	.5072	.0454	.6173	.0193
204	-.3197	.1650	.7227	.8564	.4468	.1238	.5735	-.0070
210	-.3027	.3057	.6423	.8971	.4095	.2173	.5088	.0510
216	-.2818	.3368	.5169	.8373	.3440	.2259	.4192	.0463

TABLE 13 CONTINUED

AZ	CP1	CP2	CP3	CP4	CP1	CP2	CP3	CP4
222	-.2106	.3566	.3821	.7149	.3214	.2217	.3114	-.0041
228	-.2169	.2974	.1850	.5479	.2936	.1961	.1866	-.0927
234	-.1837	.2265	-.0053	.4315	.2748	.1490	.0590	-.2056
240	-.1307	.1701	-.1939	.3435	.2689	.0975	-.0481	-.2877
246	-.0905	.0830	-.3003	.1413	.2491	.0530	-.1163	-.3546
252	-.0315	.0459	-.3383	-.1291	.2390	.0200	-.1609	-.3805
258	-.0228	-.0276	-.4338	-.4896	.2261	-.0306	-.2250	-.3941
264	-.0081	-.1167	-.5239	-.9468	.2277	-.0724	-.2770	-.3760
270	-.0276	-.1888	-.5420	-1.3464	.2203	-.1031	-.3004	-.3239
276	-.0305	-.2292	-.5575	-1.7881	.1787	-.1446	-.3304	-.2864
282	.0202	-.2007	-.4955	-2.2547	.1269	-.1282	-.3155	-.2126
288	-.0189	-.1953	-.4289	-2.5561	.0102	-.1338	-.3003	-.1227
294	-.1436	-.2481	-.4232	-2.3406	-.1223	-.1663	-.3114	-.0435
300	-.0071	-.2997	-.4868	-1.9624	-.2387	-.2167	-.3639	-.0031
306	.4711	-.3346	-.4787	-1.4804	-.5368	-.2537	-.3800	.0325
312	.6915	-.3309	-.4081	-.9642	-1.0517	-.2552	-.3681	.0950
318	.5604	-.3243	-.3474	-.5388	-1.2539	-.2343	-.3553	.1382
324	.3591	-.3161	-.3193	-.2505	-1.8435	-.2117	-.3406	.1527
330	.1384	-.2906	-.2214	.0394	-2.2936	-.1499	-.2943	.1730
336	-.1300	-.3035	-.1510	.2697	-.5812	-.0932	-.2375	.2135
342	-.3636	-.3149	-.0687	.4627	.2043	-.0914	-.1710	.2409
348	-.4553	-.2848	.0934	.6316	.4602	-.1024	-.0574	.2728
354	-.4287	-.2317	.2951	.7779	.5935	-.0775	.1014	.3255
360	-.3476	-.0815	.6158	.9137	.6178	-.0272	.3032	.3682

TABLE 14

UNSTEADY PRESSURE COEFFICIENT VERSUS BLADE AZIMUTH ANGLE

XN/R	H/R	PHI	XB1/R	XB2/R	XB3/R	XB4/R
-1.	.3	135	.62	1.21	1.71	2.26

	ADVANCE RATIO= .075		q= .26		ADVANCE RATIO= .10		q= .47
AZ	CP1	CP2	CP3	CP4	CP1	CP2	CP3	CP4
----	-----	-----	-----	-----	-----	-----	-----	-----
6	-.2698	-.1021	.3416	.3360	-.1406	.0676	.1859	.1094
12	-.4720	-.0735	.4518	.3800	-.1560	.0654	.2710	.0793
18	-.6185	-.0911	.4515	.3374	-.1434	.0477	.2783	.0188
24	-.9345	-.0331	.4277	.2755	-.1443	.0563	.2669	-.0420
30	-1.5817	.0695	.4270	.2870	-.1605	.1018	.2944	-.0486
36	-2.5566	.0424	.3669	.2552	-.1619	.0843	.2648	-.0372
42	-4.2023	.0517	.2637	.2172	-.1468	.0344	.1912	-.0302
48	-5.6433	.0963	.1764	.1528	-.1444	-.0026	.1346	-.0260
54	-4.1042	.0954	.0680	.0680	-.1374	-.0446	.0799	-.0426
60	-1.7420	.0890	-.0430	0.0000	-.1208	-.0803	.0283	-.0488
66	-.5415	.0881	-.1133	-.0533	-.1061	-.1133	-.0173	-.0600
72	.0342	.0527	-.1876	-.1382	-.0931	-.1454	-.0583	-.0781
78	.4231	.0377	-.2585	-.2224	-.0757	-.1668	-.1001	-.0780
84	.6709	.0066	-.3210	-.3073	-.0638	-.1720	-.1397	-.0791
90	.8019	-.0460	-.3699	-.3876	-.0554	-.1862	-.1796	-.0849
96	.8881	-.0802	-.4045	-.4586	-.0491	-.1797	-.2167	-.0964
102	1.0206	-.0413	-.3685	-.4983	.0183	-.1043	-.2063	-.0700
108	1.0743	-.0417	-.3080	-.5039	.0368	-.0840	-.2240	-.0570
114	1.0818	-.1070	-.3052	-.5236	.0383	-.0755	-.2441	-.0443
120	1.1261	-.1400	-.3050	-.5438	.0873	-.0449	-.2634	-.0554
126	1.1408	-.1684	-.2511	-.4796	.1055	-.0392	-.2690	-.0434
132	1.1733	-.1849	-.2142	-.3991	.1397	-.0180	-.2609	-.0238
138	1.1815	-.1951	-.1663	-.2968	.1667	-.0011	-.2422	.0025
144	1.1808	-.1916	-.0849	-.1779	.1832	.0137	-.2008	.0257
150	1.1458	-.1995	-.0463	-.0800	.1765	.0181	-.1671	.0310
156	1.0909	-.1947	-.0104	.0112	.1567	.0168	-.1392	.0244
162	.9601	-.2199	.0247	.0914	.1033	.0149	-.0902	.0160
168	.8315	-.1673	.1147	.1829	.0693	.0616	-.0083	.0272
174	.6487	-.1026	.2265	.2946	.0178	.0888	.0757	.0372
180	.4120	-.0728	.3370	.3864	-.0425	.0970	.1759	.0573
186	.1470	-.0474	.4499	.4203	-.1095	.0679	.2542	.0486
192	-.0528	-.0072	.5864	.4717	-.1353	.0605	.3441	.0378
198	-.2635	-.0120	.5929	.4394	-.1306	.0476	.3808	-.0024
204	-.5926	.0550	.5698	.3672	-.1398	.0744	.3917	-.0418
210	-1.0691	.1597	.5617	.3704	-.1538	.1163	.3947	-.0360
216	-1.7236	.1602	.4860	.3605	-.1621	.0872	.3588	-.0421

TABLE 14 CONTINUED

AZ	CP1	CP2	CP3	CP4	CP1	CP2	CP3	CP4
222	-2.4317	.1856	.3553	.3354	-.1411	.0346	.2777	-.0361
228	-2.7974	.2267	.2483	.2882	-.1349	.0030	.2075	-.0517
234	-2.1600	.2336	.1330	.2223	-.1300	-.0353	.1454	-.0723
240	-.9704	.2197	.0048	.1478	-.1137	-.0730	.0797	-.0817
246	-.0871	.2066	-.0836	.0784	-.0925	-.1087	.0278	-.0867
252	.3181	.1586	-.1828	-.0055	-.0734	-.1428	-.0210	-.0987
258	.5744	.1329	-.2592	-.0710	-.0513	-.1543	-.0637	-.1069
264	.7581	.0911	-.3357	-.1665	-.0395	-.1589	-.1081	-.1228
270	.8397	.0283	-.4036	-.2600	-.0322	-.1666	-.1476	-.1265
276	.9034	-.0120	-.4428	-.3362	-.0230	-.1545	-.1876	-.1264
282	1.0179	.0222	-.4188	-.3615	.0330	-.0893	-.1923	-.1104
288	1.0645	.0121	-.3705	-.3536	.0581	-.0520	-.1940	-.0750
294	1.0666	-.0665	-.3880	-.3747	.0694	-.0461	-.2272	-.0530
300	1.1257	-.0930	-.3955	-.4133	.1111	-.0247	-.2530	-.0521
306	1.1660	-.1257	-.3545	-.3836	.1381	-.0145	-.2536	-.0114
312	1.2175	-.1474	-.3190	-.3445	.1786	-.0007	-.2510	.0218
318	1.2483	-.1560	-.2805	-.2852	.2035	.0130	-.2460	.0423
324	1.2635	-.1563	-.2007	-.2002	.2119	.0270	-.2123	.0721
330	1.2456	-.1653	-.1603	-.1201	.2067	.0370	-.1812	.0814
336	1.1885	-.1862	-.1362	-.0460	.1774	.0300	-.1673	.0766
342	1.0380	-.2127	-.0823	.0302	.1178	.0186	-.1307	.0836
348	.8670	-.1791	-.0016	.1081	.0742	.0553	-.0572	.0997
354	.6192	-.1333	.0964	.1998	.0133	.0858	.0155	.1147
360	.2343	-.1191	.2011	.2701	-.0531	.0927	.0986	.1245

TABLE 15

UNSTEADY PRESSURE COEFFICIENT VERSUS BLADE AZIMUTH ANGLE

XN/R	H/R	PHI	XB1/R	XB2/R	XB3/R	XB4/R
-1.	.3	180	.62	1.21	1.71	2.26

	ADVANCE RATIO= .075		q= .26		ADVANCE RATIO= .10		q= .47
AZ	CP1	CP2	CP3	CP4	CP1	CP2	CP3	CP4
6	.0604	-.1359	.1565	.0734	-.0250	.1288	-.0526	.0587
12	.1250	-.2178	.1845	.1050	-.0016	.1246	-.0355	.0135
18	.1819	-.3295	.1607	.0799	.0400	.1180	-.0137	-.0454
24	.1092	-.3748	.1474	.0594	.0136	.1297	.0641	-.1058
30	.0510	-.4013	.1598	.0697	-.0155	.1370	.1463	-.1399
36	.0200	-.5077	.1009	.0539	-.0150	.1119	.2130	-.1525
42	-.0142	-.5509	.0477	.0858	-.0144	.0836	.2154	-.1530
48	-.0537	-.6495	.0158	.0827	-.0234	.0618	.2183	-.1379
54	-.0999	-.7258	-.0517	.0536	-.0327	.0176	.1907	-.1201
60	-.1334	-.6437	-.1287	.0098	-.0490	-.0428	.1527	-.0936
66	-.1747	-.4595	-.1750	-.0274	-.0551	-.0997	.1277	-.0634
72	-.2120	-.3632	-.2078	-.0775	-.0620	-.1779	.0883	-.0471
78	-.2068	-.1576	-.2242	-.1238	-.0586	-.2453	.0535	-.0399
84	-.2052	-.0035	-.2336	-.1491	-.0592	-.3109	.0162	-.0438
90	-.2363	.1181	-.2701	-.1988	-.0733	-.3709	-.0384	-.0477
96	-.2331	.2237	-.2939	-.2637	-.0811	-.3767	-.0963	-.0462
102	-.1725	.3410	-.2524	-.2697	-.0467	-.2934	-.1219	-.0206
108	-.1805	.3739	-.2212	-.2512	-.0538	-.2465	-.1839	-.0076
114	-.1536	.3846	-.2095	-.2274	-.0476	-.1796	-.2419	.0037
120	-.1000	.4101	-.1539	-.1613	-.0192	-.0945	-.2780	.0209
126	-.0712	.4120	-.1012	-.0696	-.0129	-.0390	-.3116	.0367
132	-.0458	.3796	-.0921	-.0487	.0000	.0118	-.3271	.0428
138	-.0052	.3724	-.0411	.0001	.0155	.0613	-.2968	.0640
144	.0271	.3416	.0183	.0493	.0307	.1049	-.2271	.0896
150	.0566	.2755	.0734	.0863	.0346	.1337	-.1552	.1074
156	.0920	.2057	.1392	.1479	.0377	.1469	-.0720	.1222
162	.0919	.0980	.1621	.1528	.0272	.1554	.0034	.1219
168	.1158	.0354	.2066	.1665	.0415	.1918	.0672	.1474
174	.1183	-.0409	.2569	.2165	.0284	.2061	.0907	.1689
180	.0964	-.1616	.2709	.2269	.0125	.2014	.0588	.1767
186	.0437	-.2843	.2453	.1926	-.0193	.1563	-.0601	.1379
192	.1047	-.3470	.2811	.2154	-.0033	.1336	-.0732	.1071
198	.1546	-.4167	.2380	.1884	.0305	.1264	.0408	.0516
204	.0814	-.3967	.2149	.1650	.0021	.1369	.1166	-.0130
210	.0335	-.3815	.2262	.1639	-.0220	.1426	.2197	-.0523
216	.0098	-.3928	.1589	.1305	-.0233	.1134	.2618	-.1102

TABLE 15 CONTINUED

AZ	CP1	CP2	CP3	CP4	CP1	CP2	CP3	CP4
222	-.0049	-.3566	.0877	.1254	-.0168	.0759	.2396	-.1497
228	-.0240	-.3723	.0652	.1094	-.0226	.0447	.2290	-.1839
234	-.0606	-.4004	.0256	.0923	-.0339	-.0107	.2058	-.2001
240	-.0864	-.2841	-.0467	.0551	-.0447	-.0821	.1745	-.1970
246	-.1215	-.1491	-.0882	.0087	-.0489	-.1641	.1547	-.1603
252	-.1647	-.0651	-.1426	-.0312	-.0482	-.2577	.1193	-.1184
258	-.1432	.0654	-.1710	-.0545	-.0415	-.3333	.0946	-.0881
264	-.1446	.1403	-.1963	-.0837	-.0439	-.3926	.0657	-.0819
270	-.1862	.2035	-.2457	-.1435	-.0616	-.4387	.0198	-.0880
276	-.1882	.2956	-.2713	-.2035	-.0666	-.4184	-.0257	-.0823
282	-.1382	.4022	-.2437	-.2299	-.0410	-.3245	-.0458	-.0592
288	-.1472	.4140	-.2406	-.2403	-.0451	-.2544	-.0873	-.0271
294	-.1269	.4135	-.2531	-.2590	-.0314	-.1698	-.1456	-.0088
300	-.0728	.4449	-.2154	-.2518	-.0069	-.0789	-.1898	.0084
306	-.0361	.4465	-.1666	-.2166	.0015	-.0127	-.2381	.0342
312	.0021	.4220	-.1509	-.2066	.0184	.0336	-.2814	.0385
318	.0337	.4138	-.1043	-.1817	.0315	.0742	-.2871	.0512
324	.0839	.4064	-.0255	-.1307	.0509	.1121	-.2394	.0940
330	.1082	.3605	.0010	-.0857	.0546	.1337	-.1844	.1113
336	.1395	.3157	.0401	-.0261	.0524	.1419	-.1234	.1274
342	.1379	.2361	.0564	-.0240	.0408	.1448	-.0452	.1304
348	.1571	.1759	.0826	.0059	.0510	.1729	.0348	.1480
354	.1641	.1166	.1618	.0635	.0310	.1862	.0869	.1643
360	.1311	-.0012	.1898	.0853	.0162	.1834	.0912	.1571

TABLE 16

UNSTEADY PRESSURE COEFFICIENT VERSUS BLADE AZIMUTH ANGLE

XN/R	H/R	PHI	XB1/R	XB2/R	XB3/R	XB4/R
-1.	.3	225	.62	1.21	1.71	2.26

	ADVANCE RATIO= .075		q= .26		ADVANCE RATIO= .10		q= .47	
AZ	CP1	CP2	CP3	CP4	CP1	CP2	CP3	CP4
6	.2228	.2037	.0671	.0895	-.0318	.0054	.0706	.0382
12	.3481	.1641	.0100	.0458	.0600	-.0604	-.0071	.0768
18	.3763	.1198	-.0762	-.0213	.1254	-.1012	-.0851	.0999
24	.2115	.1105	-.1226	-.0829	.0966	-.1209	-.1418	.1201
30	.0941	.0119	-.1834	-.1883	.1043	-.1599	-.1733	.1158
36	.0163	-.1405	-.2522	-.3219	.1393	-.1756	-.2037	.0983
42	-.0652	-.2621	-.2589	-.4906	.1385	-.1797	-.2256	.0661
48	-.1289	-.4261	-.2401	-.5475	.1231	-.1808	-.2142	.0129
54	-.1676	-.5522	-.2397	-.4209	.1136	-.1684	-.2065	-.0530
60	-.1886	-.5195	-.2250	-.2974	.0899	-.1587	-.2033	-.1262
66	-.2036	-.4440	-.2200	-.2218	.0628	-.1518	-.2031	-.1812
72	-.2096	-.3641	-.2202	-.1574	.0301	-.1533	-.2005	-.2226
78	-.1986	-.2452	-.2018	-.0997	.0147	-.1303	-.1849	-.2389
84	-.1817	-.2075	-.1696	-.0309	0.0000	-.0970	-.1595	-.2226
90	-.1798	-.2189	-.1614	-.0235	-.0392	-.0833	-.1512	-.2049
96	-.1921	-.1990	-.1509	.0093	-.0631	-.0447	-.1231	-.1532
102	-.1917	-.1757	-.1326	.0077	-.0703	.0112	-.0780	-.1098
108	-.2138	-.1782	-.1523	.0213	-.0876	.0361	-.0617	-.0930
114	-.1577	-.1410	-.1311	.0540	-.0795	.0810	-.0328	-.0733
120	-.1075	-.1022	-.0540	.1049	-.0774	.1294	.0205	-.0355
126	-.0768	-.0594	-.0043	.1663	-.0837	.1606	.0550	-.0104
132	-.0482	.0055	.0312	.2180	-.0855	.1880	.0877	-.0170
138	-.0190	.0981	.0971	.2828	-.0931	.2145	.1388	-.0146
144	.0086	.2191	.1653	.3175	-.0945	.2350	.1956	-.0011
150	.0423	.3425	.2424	.3426	-.0985	.2492	.2542	.0160
156	.0931	.4414	.3680	.3866	-.0941	.2558	.3172	.0260
162	.1206	.4880	.4157	.3625	-.0943	.2479	.3612	.0335
168	.1462	.5006	.4214	.3430	-.0899	.2295	.3811	.0860
174	.1548	.4390	.3780	.2543	-.0807	.1738	.3413	.1329
180	.1451	.3668	.3037	.1770	-.0691	.0722	.2286	.1403
186	.1539	.2547	.1387	.0752	-.0322	-.0480	.0798	.1283
192	.2476	.1781	.0663	.0390	.0541	-.1483	-.0152	.1467
198	.2356	.1030	-.0259	-.0698	.1016	-.2147	-.1258	.1575
204	.0552	.0548	-.0700	-.1109	.0730	-.2425	-.2282	.1605
210	-.0565	-.0704	-.1326	-.2078	.0806	-.2748	-.2933	.1569
216	-.0969	-.2279	-.2082	-.3130	.1099	-.2914	-.3021	.1466

TABLE 16 CONTINUED

AZ	CP1	CP2	CP3	CP4	CP1	CP2	CP3	CP4
222	-.1363	-.3331	-.2286	-.3933	.1254	-.2716	-.2813	.1206
228	-.1467	-.4279	-.2096	-.4780	.1117	-.2523	-.2470	.0753
234	-.1304	-.4306	-.2091	-.5541	.0907	-.2279	-.2157	.0191
240	-.1273	-.3919	-.1939	-.5596	.0741	-.1982	-.2046	-.0217
246	-.1585	-.3267	-.1895	-.4285	.0559	-.1755	-.1963	-.0579
252	-.1853	-.2427	-.1870	-.3310	.0280	-.1711	-.1998	-.0752
258	-.1844	-.1618	-.1757	-.2988	.0158	-.1558	-.1815	-.0714
264	-.1860	-.0499	-.1394	-.2472	-.0056	-.1455	-.1632	-.0537
270	-.2005	.0161	-.1325	-.1972	-.0439	-.1358	-.1566	-.0392
276	-.2141	-.0086	-.1244	-.1351	-.0624	-.0986	-.1293	-.0312
282	-.2035	-.0172	-.0980	-.0689	-.0765	-.0507	-.0886	-.0350
288	-.2126	-.0779	-.1133	-.0224	-.0863	-.0125	-.0576	-.0329
294	-.1459	-.0983	-.1063	.0231	-.0708	.0378	-.0254	-.0350
300	-.0883	-.1169	-.0325	.1305	-.0722	.0744	.0236	-.0006
306	-.0496	-.1319	.0187	.1969	-.0742	.1137	.0626	.0257
312	-.0146	-.1094	.0582	.2088	-.0739	.1445	.0926	.0149
318	.0088	-.0662	.1191	.2337	-.0885	.1640	.1437	-.0005
324	.0296	.0172	.1880	.3130	-.0894	.1972	.1891	-.0143
330	.0447	.1283	.2401	.3856	-.0890	.2183	.2531	-.0314
336	.0965	.2699	.3487	.4294	-.1025	.2356	.3104	-.0538
342	.1318	.3610	.3888	.3583	-.1037	.2424	.3540	-.0823
348	.1516	.4148	.3812	.3452	-.1026	.2300	.3693	-.0475
354	.1693	.3846	.3461	.3004	-.0948	.1930	.3419	.0065
360	.1792	.3187	.2451	.2501	-.0865	.1197	.2501	.0438

TABLE 17

UNSTEADY PRESSURE COEFFICIENT VERSUS BLADE AZIMUTH ANGLE

XN/R	H/R	PHI	XB1/R	XB2/R	XB3/R	XB4/R
-1.	.3	270	.62	1.21	1.71	2.26

	ADVANCE RATIO= .075		q= .26		ADVANCE RATIO= .10		q= .47
AZ	CP1	CP2	CP3	CP4	CP1	CP2	CP3	CP4
-----	-------	-------	-------	-------	-------	-------	-------	-------
6	-.1423	-.1448	.4605	.6691	.2577	-.0415	.4202	.0056
12	-.1818	-.2593	.2216	.5823	.4650	-.1233	.2358	.0100
18	-.4342	-.3265	.0125	.5284	.5600	-.1691	.0494	-.0013
24	-.6573	-.3657	-.1798	.4826	.5598	-.1823	-.0945	-.0414
30	-.5709	-.4830	-.3894	.2767	.5905	-.2224	-.2132	-.1005
36	-.3047	-.5097	-.5328	.0386	.6301	-.2246	-.3080	-.1320
42	.0570	-.4663	-.6001	-.2115	.6223	-.2217	-.3772	-.1552
48	.3647	-.4267	-.6264	-.4795	.6063	-.2237	-.4185	-.1693
54	.5143	-.3786	-.6425	-.7460	.5691	-.2104	-.4396	-.1639
60	.5700	-.3011	-.6335	-1.0137	.5190	-.1853	-.4371	-.1521
66	.5527	-.2420	-.6041	-1.2115	.4483	-.1648	-.4393	-.1422
72	.4823	-.2127	-.6025	-1.3277	.3679	-.1551	-.4429	-.1454
78	.4071	-.1584	-.5560	-1.3226	.3093	-.1222	-.4245	-.1453
84	.3612	-.0899	-.5024	-1.2356	.2581	-.0864	-.4024	-.1452
90	.3098	.0016	-.4358	-1.0641	.1959	-.0531	-.3774	-.1568
96	.2195	.0262	-.3887	-.8556	.1401	-.0190	-.3404	-.1409
102	.1289	.0512	-.3459	-.6772	.0948	.0135	-.3006	-.1507
108	.0691	.0886	-.3129	-.5048	.0651	.0430	-.2697	-.1675
114	.0706	.1551	-.2219	-.2962	.0638	.0799	-.2250	-.1643
120	.0774	.2419	-.0757	-.0417	.0516	.1133	-.1480	-.1180
126	.0746	.2946	.0486	.1824	.0230	.1565	-.0721	-.0469
132	.0871	.3677	.1918	.3496	-.0344	.1937	.0137	.0170
138	.0680	.4028	.3507	.4846	-.1942	.2321	.1266	.0729
144	.0112	.4175	.5191	.6147	-.5259	.2471	.2607	.1129
150	-.1667	.4544	.7515	.7608	-1.0884	.2746	.4402	.1921
156	-.6725	.4831	1.0632	.9140	-1.5075	.3129	.6569	.2524
162	-1.3230	.4706	1.2526	.9865	-1.3383	.3263	.8613	.2703
168	-.9659	.3781	1.2783	1.0036	-.8259	.3050	.9671	.2587
174	-.3189	.2349	1.2187	.9421	-.3357	.2390	.9457	.2137
180	-.1498	.1247	1.0161	.8342	-.0015	.1128	.7617	.1183
186	-.2038	-.0389	.6800	.7103	.2390	-.0082	.5249	.0274
192	-.2690	-.1640	.3668	.6185	.4204	-.1248	.2804	-.0124
198	-.3727	-.2418	.0957	.5540	.4768	-.1890	.0672	.0293
204	-.3825	-.2940	-.1258	.5116	.4546	-.2171	-.0933	.0658
210	-.1392	-.3978	-.3576	.3489	.4819	-.2585	-.2090	.0416
216	.1887	-.4365	-.5328	.1031	.5318	-.2661	-.3058	-.0136

TABLE 17 CONTINUED

AZ	CP1	CP2	CP3	CP4	CP1	CP2	CP3	CP4
222	.4222	-.4237	-.6064	-.1281	.5434	-.2643	-.3811	-.0487
228	.5717	-.4101	-.6409	-.3919	.5214	-.2681	-.4223	-.0612
234	.6282	-.3642	-.6740	-.6047	.4818	-.2657	-.4445	-.0489
240	.6170	-.3172	-.6707	-.8291	.4446	-.2435	-.4481	-.0272
246	.5386	-.2581	-.6737	-1.0397	.3873	-.2186	-.4394	-.0150
252	.4498	-.2196	-.7009	-1.1522	.3243	-.1992	-.4432	-.0181
258	.3898	-.1640	-.6727	-1.1612	.2697	-.1710	-.4257	-.0219
264	.3446	-.0950	-.6257	-1.0949	.2130	-.1394	-.4069	-.0438
270	.2802	-.0222	-.5556	-.9434	.1537	-.1072	-.3799	-.0562
276	.1980	-.0080	-.5314	-.7691	.1040	-.0753	-.3522	-.0687
282	.1138	.0135	-.4828	-.6131	.0689	-.0424	-.3190	-.0841
288	.0481	.0402	-.4372	-.4559	.0545	-.0044	-.2837	-.1134
294	.0444	.0983	-.3496	-.2563	.0618	.0395	-.2377	-.1155
300	.0532	.1740	-.2090	-.0135	.0451	.0704	-.1683	-.0740
306	.0519	.2222	-.0927	.2080	-.0000	.1078	-.0964	-.0065
312	.0769	.2944	.0600	.3835	-.0765	.1535	-.0133	.0452
318	.0753	.3169	.2279	.5278	-.2708	.1635	.0909	.0662
324	.0736	.3255	.3974	.6526	-.6546	.1884	.2082	.0995
330	.0483	.3492	.5853	.7988	-1.4019	.2073	.3767	.1495
336	-.0091	.3871	.8736	.9366	-2.1157	.2633	.5836	.1900
342	-.3343	.3900	1.0666	.9993	-2.0206	.2669	.7703	.1987
348	-1.0297	.3146	1.1083	1.0114	-1.3503	.2596	.8682	.1908
354	-1.2548	.1512	1.0222	.9623	-.6038	.2058	.8484	.1225
360	-.6371	.0357	.8318	.8400	-.1185	.0931	.6744	.0495

TABLE 18

UNSTEADY PRESSURE COEFFICIENT VERSUS BLADE AZIMUTH ANGLE

XN/R	H/R	PHI	XB1/R	XB2/R	XB3/R	XB4/R
-1.	.3	315	.62	1.21	1.71	2.26

	ADVANCE RATIO= .075	q= .26			ADVANCE RATIO= .10	q= .47	
AZ	CP1	CP2	CP3	CP4	CP1	CP2	CP3	CP4
---	---	---	---	---	---	---	---	---
6	.7259	.1049	1.9556	-.7812	.5242	.2571	1.2276	.0616
12	.6412	-.1064	1.5121	-1.0053	.4960	.0988	.8761	.0696
18	.3682	-.2246	1.1134	-1.1353	.3744	-.0212	.5478	.1104
24	.1562	-.3542	.6102	-1.1839	.2950	-.0943	.2316	.1234
30	.2328	-.4937	.0946	-.9958	.3310	-.1653	-.0598	.0905
36	.4256	-.5116	-.2753	-.5808	.4382	-.2121	-.3073	.0699
42	.5738	-.5266	-.5670	-.0716	.4845	-.2546	-.4749	.0364
48	.6020	-.5312	-.7939	.3155	.4762	-.2986	-.6037	-.0094
54	.5086	-.5028	-.9531	.5656	.4118	-.3163	-.6759	-.0327
60	.3764	-.4686	-1.0250	.6363	.3308	-.3055	-.6911	-.0409
66	.2035	-.4346	-1.0757	.6087	.2143	-.3021	-.7169	-.0531
72	.0439	-.4266	-1.1503	.5311	.1001	-.3069	-.7306	-.0658
78	-.0916	-.4124	-1.1988	.4644	.0099	-.2949	-.7350	-.0774
84	-.1714	-.3549	-1.2106	.3838	-.0811	-.2792	-.7309	-.0821
90	-.2220	-.2600	-1.1666	.3468	-.1858	-.2490	-.6999	-.0685
96	-.2893	-.2250	-1.1745	.2993	-.2887	-.2306	-.6752	-.0514
102	-.3509	-.1855	-1.1866	.2284	-.4710	-.2147	-.6523	-.0620
108	-.3626	-.1027	-1.1673	.1670	-.7104	-.1762	-.6208	-.0717
114	-.3738	-.0205	-1.0999	.1487	-.7871	-.1530	-.5844	-.0823
120	-.4006	.0940	-.9901	.1545	-.8194	-.1128	-.5211	-.0786
126	-.6757	.2093	-.8449	.1494	-.7495	-.0589	-.4467	-.0774
132	-1.4216	.3741	-.6573	.1473	-.5315	.0125	-.3406	-.0893
138	-1.1188	.4932	-.4602	.1303	-.3258	.0891	-.2115	-.1137
144	-.4052	.6072	-.1768	.1159	-.1463	.1826	-.0386	-.1154
150	-.3306	.7524	.2447	.1487	-.0192	.3177	.2468	-.0693
156	-.1617	.8635	.8943	.2010	.0623	.4830	.6438	.0123
162	.1108	.9272	1.6027	.2326	.1431	.6107	1.1491	.1016
168	.2376	.8010	2.1732	.1503	.1993	.6930	1.6457	.1648
174	.3638	.6173	2.5690	-.0201	.2622	.6680	1.9564	.1778
180	.5065	.4457	2.5362	-.2951	.3447	.5097	1.8449	.1475
186	.5744	.1917	2.0793	-.5706	.4038	.3274	1.4884	.1110
192	.4831	-.0734	1.5611	-.7903	.3532	.1359	1.0482	.1154
198	.1700	-.2838	1.1056	-.9306	.1956	.0092	.6419	.1466
204	-.0567	-.4351	.6057	-.9628	.1120	-.0848	.2684	.1444
210	.0676	-.5605	.0545	-.8728	.1880	-.1507	-.0188	.1138
216	.3213	-.5169	-.3612	-.5602	.3559	-.1973	-.2674	.0781

TABLE 18 CONTINUED

AZ	CP1	CP2	CP3	CP4	CP1	CP2	CP3	CP4
222	.5100	-.4895	-.6173	-.1098	.4406	-.2457	-.4625	.0459
228	.5932	-.4881	-.8017	.2798	.4373	-.2898	-.5868	-.0022
234	.5030	-.4829	-.9394	.4884	.3714	-.3121	-.6692	-.0206
240	.3702	-.4691	-.9993	.5923	.2901	-.3075	-.6946	-.0223
246	.1966	-.4427	-1.0230	.5758	.1754	-.3046	-.7189	-.0289
252	.0317	-.4458	-1.0762	.4919	.0664	-.3073	-.7417	-.0400
258	-.0835	-.4371	-1.0842	.4148	-.0416	-.3055	-.7465	-.0422
264	-.1565	-.3775	-1.0685	.3305	-.1450	-.2947	-.7459	-.0611
270	-.2126	-.3012	-1.0079	.2996	-.2369	-.2704	-.7213	-.0595
276	-.2857	-.2757	-.9957	.2481	-.3248	-.2599	-.6982	-.0496
282	-.3587	-.2478	-.9724	.1675	-.4163	-.2466	-.6803	-.0535
288	-.3815	-.1704	-.9393	.1004	-.6237	-.2202	-.6436	-.0741
294	-.3972	-.0986	-.9035	.0752	-.7975	-.1952	-.6126	-.0939
300	-.3780	.0055	-.8290	.0879	-.8145	-.1644	-.5516	-.1120
306	-.3752	.1086	-.7162	.0976	-.8016	-.1283	-.4836	-.1324
312	-.5083	.2691	-.5174	.1096	-.6514	-.0428	-.3797	-.1640
318	-1.1696	.3733	-.3163	.0943	-.4633	.0224	-.2631	-.1965
324	-1.1236	.4511	-.0341	.0632	-.2617	.1405	-.1081	-.1982
330	-.4298	.5798	.3625	.0900	-.1164	.2645	.1493	-.1502
336	-.1835	.6554	.9875	.1282	.0197	.4393	.5288	-.0756
342	.0229	.7459	1.6634	.1315	.1144	.5351	.9992	.0031
348	.2340	.6522	2.2214	.0308	.2065	.6101	1.4460	.0950
354	.3929	.4626	2.5435	-.1497	.2936	.5946	1.7241	.1265
360	.5621	.3050	2.4751	-.4485	.4072	.4544	1.6145	.0958

TABLE 19

UNSTEADY PRESSURE COEFFICIENT VERSUS BLADE AZIMUTH ANGLE

XN/R	H/R	PHI	XB1/R	XB2/R	XB3/R	XB4/R
-1.	.3	0	.62	1.21	1.71	2.26

	ADVANCE RATIO= .15		q= 1.05		ADVANCE RATIO= .20		q= 1.87	
AZ	CP1	CP2	CP3	CP4	CP1	CP2	CP3	CP4
6	.2337	.4709	1.3282	.1864	.0169	.0738	1.0888	.0063
12	.2154	.3791	1.0687	.0941	-.0268	.1994	.8524	-.0271
18	.2685	.2967	.7508	.0620	-.0157	.2306	.5750	-.0380
24	.3498	.1974	.4823	.0587	.0233	.2201	.3784	-.0275
30	.3922	.1355	.2666	.0292	.0575	.1834	.2245	-.0350
36	.3493	.0886	.1024	-.0077	.0475	.1331	.0972	-.0430
42	.1397	.0086	-.0611	-.0461	.0261	.0821	-.0156	-.0740
48	-.2728	-.0757	-.1827	-.1005	-.0065	.0380	-.0923	-.1016
54	-.6908	-.1435	-.2727	-.1462	-.0301	.-.0091	-.1636	-.1379
60	-.6493	-.1803	-.3296	-.1892	-.0529	-.0478	-.2137	-.1453
66	-.3471	-.1993	-.3638	-.2055	-.0586	-.0676	-.2359	-.1313
72	-.1677	-.2218	-.4026	-.2255	-.0568	-.0809	-.2655	-.1256
78	-.1196	-.2444	-.4344	-.2378	-.0667	-.0993	-.2966	-.1238
84	-.1081	-.2559	-.4546	-.2343	-.0678	-.0942	-.3161	-.1111
90	-.0993	-.2564	-.4599	-.2198	-.0597	-.0916	-.3427	-.1025
96	-.1051	-.2581	-.4724	-.2056	-.0555	-.0912	-.3571	-.0978
102	-.1271	-.2476	-.4666	-.1715	-.0570	-.0867	-.3516	-.0730
108	-.1121	-.2255	-.4541	-.1382	-.0495	-.0732	-.3481	-.0199
114	-.0790	-.2033	-.4473	-.1107	-.0453	-.0580	-.3439	.0349
120	-.0704	-.1969	-.4466	-.0874	-.0363	-.0535	-.3547	.0654
126	-.0436	-.1674	-.4295	-.0433	-.0336	-.0901	-.3507	.1053
132	-.0190	-.1351	-.4016	.0216	-.0179	-.0695	-.3425	.1213
138	.0169	-.0985	-.3710	.1062	-.0049	-.0365	-.3267	.1200
144	.0441	-.0662	-.3297	.1829	.0149	-.0581	-.2952	.1160
150	.0890	-.0026	-.2509	.2492	.0342	-.0591	-.2478	.1027
156	.1330	.0640	-.1139	.2802	.0570	-.0178	-.1381	.1028
162	.1884	.1576	.0957	.3125	.0911	.0115	.0159	.0978
168	.2281	.2463	.4055	.3062	.1110	.0235	.2578	.0966
174	.2436	.3687	.9236	.3056	.1094	-.0260	.5975	.0942
180	.2056	.4985	1.4122	.2726	.0756	-.0563	1.1083	.0967
186	.1544	.5085	1.4768	.1941	-.0229	.1080	1.1696	.0351
192	.1476	.3972	1.2319	.1012	-.0638	.2669	.9236	-.0190
198	.2478	.3014	.8793	.0560	-.0319	.2725	.6109	-.0283
204	.3407	.2128	.5446	.0477	.0120	.2524	.3902	-.0285
210	.3822	.1547	.3210	.0042	.0496	.2209	.2532	-.0366
216	.3455	.1125	.1506	-.0364	.0392	.1495	.1086	-.0484

TABLE 19 CONTINUED

AZ	CP1	CP2	CP3	CP4	CP1	CP2	CP3	CP4
222	.1392	.0310	-.0226	-.0802	.0181	.0913	-.0076	-.0754
228	-.2995	-.0550	-.1632	-.1413	-.0116	.0503	-.0872	-.0877
234	-.8009	-.1223	-.2605	-.1915	-.0331	.0019	-.1586	-.1167
240	-.8227	-.1584	-.3162	-.2257	-.0584	-.0377	-.2115	-.1337
246	-.4282	-.1847	-.3584	-.2374	-.0609	-.0603	-.2361	-.1263
252	-.1936	-.2090	-.3955	-.2497	-.0621	-.0855	-.2698	-.1214
258	-.1366	-.2404	-.4265	-.2504	-.0717	-.1018	-.2997	-.1162
264	-.1238	-.2538	-.4473	-.2434	-.0725	-.0964	-.3174	-.1045
270	-.1183	-.2527	-.4575	-.2261	-.0660	-.0996	-.3520	-.0936
276	-.1365	-.2557	-.4762	-.2085	-.0619	-.0940	-.3608	-.0869
282	-.1642	-.2459	-.4794	-.1786	-.0617	-.0942	-.3613	-.0509
288	-.1310	-.2165	-.4697	-.1456	-.0535	-.0806	-.3571	-.0021
294	-.0956	-.2031	-.4662	-.1118	-.0485	-.0700	-.3554	.0545
300	-.0841	-.2007	-.4689	-.0977	-.0368	-.0662	-.3597	.0990
306	-.0498	-.1705	-.4532	-.0522	-.0313	-.1051	-.3604	.1238
312	-.0263	-.1463	-.4269	.0151	-.0162	-.0926	-.3469	.1409
318	.0128	-.1018	-.4005	.0832	.0015	-.0492	-.3360	.1377
324	.0433	-.0813	-.3687	.1465	.0197	-.0814	-.3002	.1401
330	.0939	-.0240	-.2955	.2209	.0427	-.0869	-.2594	.1328
336	.1514	.0465	-.1705	.2742	.0643	-.0508	-.1578	.1359
342	.2162	.1206	.0191	.3056	.1021	-.0034	-.0176	.1181
348	.2665	.2008	.3118	.3194	.1243	.0139	.2111	.1134
354	.3038	.3223	.7974	.3315	.1379	-.0302	.5349	.1021
360	.2847	.4567	1.2913	.3145	.1163	-.0675	1.0263	.0925

TABLE 20

UNSTEADY PRESSURE COEFFICIENT VERSUS BLADE AZIMUTH ANGLE

XN/R	H/R	PHI	XB1/R	XB2/R	XB3/R	XB4/R
-1.	.3	45	.62	1.21	1.71	2.26

	ADVANCE RATIO= .15		q= 1.05		ADVANCE RATIO= .20		q= 1.87
AZ	CP1	CP2	CP3	CP4	CP1	CP2	CP3	CP4
6	.1948	.1711	.7257	-.0175	.0545	.1408	.5722	.0427
12	.1735	.2028	.8488	-.0661	.0491	.2154	.6460	.0166
18	.1354	.2433	.7936	-.0901	.0366	.2431	.5902	-.0015
24	.0537	.2984	.6291	-.0544	.0148	.2606	.4167	-.0036
30	-.0472	.3468	.4500	-.0283	-.0095	.2658	.2734	.0116
36	-.1502	.3390	.3640	.0044	-.0317	.2396	.1922	.0163
42	-.2399	.2783	.2252	.0201	-.0576	.1951	.1055	.0076
48	-.2771	.2007	.0863	.0152	-.0674	.1551	.0362	.0113
54	-.2770	.1344	-.0283	.0162	-.0781	.0985	-.0426	-.0048
60	-.2443	.0878	-.1103	.0303	-.0834	.0415	-.0977	-.0033
66	-.2007	.0493	-.1607	.0533	-.0880	-.0081	-.1331	-.0007
72	-.1696	-.0003	-.2108	.0565	-.0830	-.0376	-.1577	.0006
78	-.1516	-.0474	-.2458	.0635	-.0844	-.0692	-.1853	-.0023
84	-.1415	-.0996	-.2785	.0714	-.0859	-.0807	-.1836	-.0060
90	-.1179	-.1266	-.2888	.0798	-.0807	-.0851	-.1738	-.0047
96	-.0959	-.1628	-.3097	.0751	-.0668	-.0884	-.1725	-.0111
102	-.0768	-.1801	-.3162	.0655	-.0606	-.0956	-.1789	-.0147
108	-.0574	-.1863	-.3110	.0617	-.0538	-.0964	-.1955	-.0239
114	-.0344	-.2022	-.3242	.0422	-.0467	-.0986	-.2089	-.0209
120	-.0232	-.2228	-.3420	.0151	-.0292	-.1023	-.2325	-.0295
126	.0215	-.2209	-.3391	-.0018	-.0153	-.0208	-.2357	-.0259
132	.0677	-.2162	-.3341	-.0313	.0125	.1553	-.2333	-.0218
138	.1243	-.2115	-.3314	-.0524	.0351	.1864	-.2323	-.0246
144	.1579	-.2140	-.3219	-.0931	.0641	.1438	-.2222	-.0194
150	.2002	-.2003	-.2980	-.1082	.0873	.0268	-.2161	-.0180
156	.1981	-.1845	-.2579	-.1280	.0983	-.2326	-.1790	-.0047
162	.1842	-.1462	-.1833	-.1123	.1027	-.5473	-.1359	.0071
168	.1450	-.0934	-.0640	-.0843	.0806	-.5824	-.0502	.0210
174	.1138	-.0170	.1592	-.0406	.0525	-.3483	.0810	.0359
180	.1242	.0928	.4765	.0106	.0436	-.0735	.3324	.0543
186	.1499	.1661	.7464	.0152	.0343	.1305	.5804	.0506
192	.1413	.1898	.9428	-.0068	.0440	.2283	.6828	.0134
198	.1011	.2655	.9026	-.0440	.0317	.2615	.6399	.0033
204	.0077	.3296	.7081	-.0068	.0073	.2813	.4422	-.0007
210	-.0835	.3680	.4971	.0154	-.0102	.2963	.3121	.0148
216	-.1844	.3653	.4017	.0494	-.0351	.2651	.2175	.0224

TABLE 20 CONTINUED

AZ	CP1	CP2	CP3	CP4	CP1	CP2	CP3	CP4
222	-.2689	.3093	.2523	.0640	-.0591	.2153	.1267	.0129
228	-.3016	.2350	.1099	.0557	-.0690	.1815	.0577	.0201
234	-.2929	.1698	-.0135	.0485	-.0748	.1239	-.0268	.0045
240	-.2553	.1212	-.0986	.0543	-.0830	.0643	-.0854	.0029
246	-.2030	.0745	-.1534	.0698	-.0817	.0089	-.1243	.0032
252	-.1642	.0256	-.2047	.0774	-.0794	-.0321	-.1570	.0020
258	-.1482	-.0334	-.2459	.0784	-.0788	-.0602	-.1841	-.0009
264	-.1353	-.0914	-.2832	.0748	-.0824	-.0689	-.1898	-.0070
270	-.1127	-.1226	-.2939	.0783	-.0753	-.0830	-.1845	-.0090
276	-.0943	-.1559	-.3202	.0688	-.0608	-.0747	-.1761	-.0104
282	-.0701	-.1716	-.3262	.0552	-.0491	-.0929	-.1830	-.0178
288	-.0436	-.1796	-.3220	.0530	-.0462	-.0973	-.1947	-.0283
294	-.0188	-.2023	-.3349	.0297	-.0347	-.1006	-.2026	-.0283
300	-.0050	-.2281	-.3511	.0025	-.0149	-.1063	-.2235	-.0393
306	.0442	-.2260	-.3471	-.0194	.0005	-.0067	-.2332	-.0367
312	.0915	-.2263	-.3403	-.0484	.0251	.1706	-.2327	-.0386
318	.1532	-.2172	-.3355	-.0864	.0610	.1910	-.2371	-.0451
324	.2044	-.2214	-.3277	-.1079	.0873	.1432	-.2282	-.0418
330	.2570	-.2112	-.3073	-.1091	.1145	.0177	-.2258	-.0405
336	.2787	-.1928	-.2706	-.1163	.1293	-.2100	-.1847	-.0259
342	.2665	-.1690	-.2074	-.1181	.1402	-.4946	-.1419	-.0101
348	.2208	-.1215	-.0918	-.0912	.1134	-.5923	-.0647	.0045
354	.1932	-.0478	.1158	-.0459	.0807	-.4301	.0580	.0255
360	.1863	.0646	.4214	.0029	.0625	-.1582	.2893	.0468

TABLE 21

UNSTEADY PRESSURE COEFFICIENT VERSUS BLADE AZIMUTH ANGLE

XN/R	H/R	PHI	XB1/R	XB2/R	XB3/R	XB4/R
-1.	.3	90	.62	1.21	1.71	2.26

	ADVANCE RATIO= .15		q= 1.06		ADVANCE RATIO= .20		q= 1.88
AZ	CP1	CP2	CP3	CP4	CP1	CP2	CP3	CP4
6	-.0032	.1075	.2853	.0862	.0186	.0612	.2340	.0346
12	-.0274	.1380	.4102	.0885	-.0157	.0887	.2897	.0182
18	-.0729	.1348	.4150	.0519	-.0286	.1004	.3003	-.0014
24	-.1049	.1539	.3695	.0363	-.0446	.1180	.2596	-.0087
30	-.1197	.2299	.2991	.0374	-.0643	.1560	.2365	-.0073
36	-.1481	.2015	.2257	.0396	-.0708	.1504	.1684	-.0001
42	-.1461	.1214	.1420	.0439	-.0717	.1396	.1233	.0068
48	-.1419	.0392	.0708	.0139	-.0751	.1311	.0767	.0078
54	-.1514	-.0410	-.0083	-.0095	-.0746	.0988	.0193	.0024
60	-.1348	-.0805	-.0464	-.0001	-.0705	.0654	-.0211	.0105
66	-.1112	-.1005	-.0829	.0020	-.0673	.0375	-.0462	.0128
72	-.0942	-.1121	-.1224	-.0116	-.0671	.0106	-.0776	.0043
78	-.0873	-.1095	-.1562	-.0235	-.0588	-.0069	-.1069	-.0007
84	-.0674	-.0826	-.1660	-.0192	-.0486	-.0215	-.1278	.0015
90	-.0480	-.0680	-.1697	-.0250	-.0504	-.0473	-.1525	-.0018
96	-.0379	-.0608	-.1875	-.0436	-.0338	-.0499	-.1631	-.0029
102	-.0083	-.0257	-.1634	-.0348	-.0153	-.0599	-.1813	-.0101
108	.0215	-.0188	-.1667	-.0356	-.0035	-.0806	-.1818	-.0166
114	.0367	-.0279	-.1665	-.0475	-.0022	-.0969	-.1473	-.0252
120	.0591	-.0390	-.1708	-.0634	.0246	-.0903	-.1057	-.0261
126	.0853	-.0531	-.1612	-.0650	.0521	-.1011	-.0809	-.0283
132	.1310	-.0552	-.1451	-.0584	.0736	-.1062	-.0652	-.0224
138	.1781	-.0519	-.1295	-.0528	.1016	-.1108	-.0626	-.0265
144	.1996	-.0625	-.1244	-.0566	.1190	-.1068	-.0690	-.0313
150	.2240	-.0535	-.0982	-.0392	.1354	-.0937	-.0639	-.0193
156	.2188	-.0589	-.0908	-.0422	.1299	-.0863	-.0572	-.0200
162	.1805	-.0632	-.0685	-.0376	.1078	-.0791	-.0570	-.0231
168	.1484	-.0470	-.0192	-.0223	.0910	-.0494	-.0232	-.0087
174	.1217	-.0092	.0558	-.0031	.0803	-.0266	.0179	.0052
180	.0786	.0370	.1583	.0143	.0486	-.0052	.0905	.0145
186	.0304	.0738	.2443	.0213	.0190	.0428	.2033	.0333
192	-.0069	.0631	.3520	.0231	-.0019	.0848	.2419	.0231
198	-.0580	.0783	.3746	-.0064	-.0274	.0856	.2647	.0010
204	-.0897	.1397	.3181	-.0204	-.0498	.1152	.2484	-.0003
210	-.1077	.1886	.2841	-.0122	-.0605	.1509	.2232	.0117
216	-.1347	.1323	.2129	-.0021	-.0692	.1392	.1445	.0155

TABLE 21 CONTINUED

AZ	CP1	CP2	CP3	CP4	CP1	CP2	CP3	CP4
222	-.1380	.0605	.1353	.0053	-.0749	.1146	.0893	.0088
228	-.1406	-.0062	.0682	-.0126	-.0839	.1046	.0520	.0123
234	-.1508	-.0841	-.0061	-.0375	-.0842	.0885	.0188	.0087
240	-.1400	-.1199	-.0484	-.0249	-.0754	.0617	-.0236	.0099
246	-.1214	-.1335	-.0872	-.0189	-.0790	.0116	-.0721	-.0014
252	-.1074	-.1327	-.1254	-.0255	-.0807	-.0124	-.0922	-.0067
258	-.1092	-.1266	-.1564	-.0316	-.0679	-.0202	-.1094	-.0126
264	-.0966	-.1092	-.1710	-.0207	-.0661	-.0422	-.1474	-.0226
270	-.0766	-.1034	-.1760	-.0205	-.0726	-.0622	-.1716	-.0215
276	-.0624	-.0896	-.1955	-.0315	-.0463	-.0469	-.1727	-.0119
282	-.0353	-.0487	-.1775	-.0194	-.0215	-.0558	-.1944	-.0173
288	-.0096	-.0270	-.1717	-.0102	-.0301	-.0821	-.1952	-.0265
294	.0011	-.0361	-.1777	-.0154	-.0186	-.0876	-.1458	-.0238
300	.0190	-.0375	-.1776	-.0230	.0018	-.0939	-.1020	-.0241
306	.0428	-.0491	-.1716	-.0267	.0170	-.1017	-.0719	-.0260
312	.0738	-.0547	-.1560	-.0183	.0406	-.1065	-.0535	-.0187
318	.1115	-.0480	-.1387	-.0163	.0668	-.1046	-.0505	-.0177
324	.1263	-.0525	-.1381	-.0287	.0839	-.1048	-.0592	-.0268
330	.1400	-.0397	-.1113	-.0129	.0900	-.1031	-.0662	-.0235
336	.1400	-.0406	-.1003	-.0125	.0942	-.0916	-.0588	-.0194
342	.1061	-.0351	-.0765	-.0090	.0794	-.0776	-.0545	-.0212
348	.0856	-.0224	-.0287	.0074	.0675	-.0529	-.0216	-.0130
354	.0634	.0100	.0481	.0359	.0548	-.0351	.0172	-.0052
360	.0429	.0561	.1644	.0702	.0427	-.0002	.0996	.0159

TABLE 22

UNSTEADY PRESSURE COEFFICIENT VERSUS BLADE AZIMUTH ANGLE

XN/R	H/R	PHI	XB1/R	XB2/R	XB3/R	XB4/R
-1.	.3	135	.62	1.21	1.71	2.26

	ADVANCE RATIO= .15		q= 1.06		ADVANCE RATIO= .20		q= 1.88
AZ	CP1	CP2	CP3	CP4	CP1	CP2	CP3	CP4
---	---	---	---	---	---	---	---	---
6	.0042	.0606	.1616	.0789	-.0023	.0168	.1016	.0540
12	-.0126	.0533	.1761	.0804	-.0008	.0411	.1133	.0434
18	-.0226	.0606	.1834	.0609	-.0125	.0204	.1129	.0270
24	-.0426	.0792	.1784	.0435	-.0182	.0466	.1212	.0269
30	-.0413	.1021	.1579	.0428	-.0270	.0551	.0982	.0152
36	-.0569	.0831	.1110	.0219	-.0279	.0496	.0799	.0108
42	-.0593	.0777	.0739	.0255	-.0370	.0451	.0572	.0063
48	-.0596	.0649	.0225	.0043	-.0357	.0494	.0498	.0093
54	-.0675	.0378	-.0331	-.0220	-.0342	.0398	.0263	-.0061
60	-.0715	.0142	-.0773	-.0383	-.0373	.0274	.0011	-.0162
66	-.0680	.0020	-.1031	-.0396	-.0348	.0106	-.0171	-.0284
72	-.0555	-.0204	-.1274	-.0416	-.0374	.0010	-.0243	-.0336
78	-.0528	-.0555	-.1524	-.0476	-.0253	-.0015	-.0330	-.0394
84	-.0568	-.0979	-.1754	-.0557	-.0360	-.0251	-.0541	-.0564
90	-.0620	-.1389	-.1817	-.0602	-.0393	-.0349	-.0593	-.0628
96	-.0452	-.1502	-.1736	-.0604	-.0322	-.0270	-.0568	-.0524
102	-.0339	-.1411	-.1465	-.0649	-.0126	-.0355	-.0647	-.0509
108	-.0186	-.1101	-.1047	-.0569	-.0193	-.0401	-.0644	-.0327
114	-.0104	-.0793	-.0733	-.0454	-.0068	-.0394	-.0647	-.0165
120	.0077	-.0662	-.0559	-.0459	-.0054	-.0478	-.0708	-.0077
126	.0187	-.0536	-.0492	-.0360	.0168	-.0398	-.0635	.0055
132	.0383	-.0463	-.0388	-.0308	.0123	-.0557	-.0788	.0009
138	.0539	-.0365	-.0345	-.0243	.0305	-.0396	-.0630	.0131
144	.0761	-.0203	-.0143	-.0064	.0433	-.0409	-.0708	.0051
150	.0812	-.0220	-.0133	.0012	.0451	-.0450	-.0606	.0109
156	.0769	-.0157	.0049	.0142	.0511	-.0333	-.0450	.0128
162	.0737	-.0107	.0140	.0134	.0458	-.0300	-.0318	.0138
168	.0641	.0040	.0437	.0326	.0399	-.0256	-.0139	.0141
174	.0517	.0221	.0766	.0511	.0312	-.0128	.0190	.0346
180	.0196	.0417	.1264	.0718	.0169	-.0038	.0403	.0317
186	.0035	.0646	.1716	.0812	-.0002	.0152	.0961	.0497
192	-.0148	.0649	.1936	.0856	-.0003	.0438	.1225	.0474
198	-.0247	.0736	.2081	.0677	-.0128	.0234	.1233	.0256
204	-.0461	.0936	.2005	.0443	-.0202	.0551	.1352	.0295
210	-.0439	.1173	.1809	.0478	-.0274	.0617	.1149	.0172
216	-.0583	.0972	.1308	.0237	-.0278	.0589	.0955	.0150

TABLE 22 CONTINUED

AZ	CP1	CP2	CP3	CP4	CP1	CP2	CP3	CP4
222	-.0620	.0934	.0922	.0239	-.0345	.0540	.0699	.0091
228	-.0608	.0874	.0384	.0056	-.0354	.0560	.0586	.0092
234	-.0631	.0669	-.0157	-.0194	-.0328	.0508	.0353	-.0063
240	-.0675	.0427	-.0677	-.0396	-.0337	.0386	.0105	-.0142
246	-.0600	.0281	-.0946	-.0456	-.0321	.0164	-.0146	-.0315
252	-.0489	.0044	-.1202	-.0468	-.0379	.0072	-.0215	-.0349
258	-.0472	-.0348	-.1498	-.0515	-.0211	.0090	-.0289	-.0398
264	-.0512	-.0851	-.1776	-.0591	-.0301	-.0166	-.0538	-.0612
270	-.0581	-.1316	-.1882	-.0654	-.0353	-.0298	-.0602	-.0711
276	-.0404	-.1449	-.1780	-.0672	-.0254	-.0204	-.0552	-.0611
282	-.0290	-.1374	-.1510	-.0738	-.0080	-.0323	-.0684	-.0599
288	-.0070	-.1028	-.0998	-.0606	-.0144	-.0374	-.0676	-.0331
294	.0001	-.0768	-.0678	-.0522	-.0004	-.0406	-.0694	-.0101
300	.0213	-.0606	-.0499	-.0516	-.0010	-.0484	-.0750	-.0006
306	.0306	-.0533	-.0413	-.0412	.0207	-.0400	-.0696	.0100
312	.0522	-.0469	-.0326	-.0343	.0214	-.0544	-.0862	.0021
318	.0693	-.0369	-.0290	-.0309	.0371	-.0425	-.0731	.0109
324	.0890	-.0249	-.0129	-.0125	.0529	-.0394	-.0731	.0059
330	.0979	-.0264	-.0125	-.0031	.0501	-.0466	-.0630	.0085
336	.0940	-.0217	.0015	.0077	.0586	-.0368	-.0470	.0103
342	.0930	-.0188	.0087	.0116	.0509	-.0332	-.0327	.0136
348	.0721	-.0105	.0328	.0248	.0441	-.0296	-.0197	.0098
354	.0608	.0126	.0676	.0482	.0294	-.0189	.0105	.0304
360	.0272	.0305	.1122	.0677	.0213	-.0063	.0378	.0324

TABLE 23

UNSTEADY PRESSURE COEFFICIENT VERSUS BLADE AZIMUTH ANGLE

XN/R	H/R	PHI	XB1/R	XB2/R	XB3/R	XB4/R
-1.	.3	180	.62	1.21	1.71	2.26

	ADVANCE RATIO= .15		q= 1.06		ADVANCE RATIO= .20		q= 1.88	
AZ	CP1	CP2	CP3	CP4	CP1	CP2	CP3	CP4
6	.0091	.0250	.1055	.0823	-.0018	.0164	.0732	.0432
12	.0208	.0018	.0852	.0749	.0237	.0317	.0554	.0290
18	.0270	-.0011	.0761	.0602	.0152	-.0070	.0275	.0072
24	.0083	.0133	.0736	.0436	.0101	.0115	.0395	.0150
30	.0196	.0282	.0757	.0502	.0053	.0171	.0317	.0079
36	.0056	.0038	.0396	.0235	.0063	.0056	.0146	.0019
42	.0093	.0110	.0339	.0252	.0016	.0068	.0091	.0008
48	.0039	.0133	.0165	.0062	.0032	.0120	.0070	.0021
54	-.0074	-.0031	-.0165	-.0230	-.0043	.0029	-.0069	-.0069
60	-.0224	-.0151	-.0398	-.0518	-.0083	-.0032	-.0189	-.0098
66	-.0262	-.0103	-.0528	-.0699	-.0138	-.0117	-.0308	-.0153
72	-.0221	-.0113	-.0657	-.0941	-.0195	-.0140	-.0302	-.0099
78	-.0200	-.0145	-.0824	-.1261	-.0064	-.0045	-.0266	-.0082
84	-.0262	-.0211	-.0956	-.1451	-.0219	-.0250	-.0457	-.0218
90	-.0406	-.0369	-.1113	-.1555	-.0238	-.0216	-.0400	-.0205
96	-.0371	-.0322	-.1077	-.1285	-.0250	-.0255	-.0493	-.0280
102	-.0369	-.0374	-.1070	-.1042	-.0217	-.0267	-.0485	-.0336
108	-.0321	-.0386	-.0955	-.0674	-.0220	-.0237	-.0465	-.0288
114	-.0276	-.0320	-.0779	-.0330	-.0173	-.0245	-.0466	-.0287
120	-.0146	-.0319	-.0614	-.0119	-.0138	-.0210	-.0384	-.0214
126	-.0207	-.0362	-.0572	-.0003	-.0017	-.0146	-.0333	-.0159
132	-.0136	-.0349	-.0435	.0127	-.0176	-.0310	-.0451	-.0230
138	-.0045	-.0289	-.0332	.0169	-.0023	-.0105	-.0211	-.0050
144	.0107	-.0124	-.0032	.0352	.0066	-.0094	-.0174	-.0066
150	.0130	-.0177	.0045	.0449	.0060	-.0100	-.0054	.0008
156	.0125	-.0069	.0357	.0563	.0122	.0030	.0164	.0100
162	.0139	-.0018	.0551	.0546	.0153	.0074	.0281	.0140
168	.0105	.0035	.0787	.0674	.0067	.0023	.0366	.0145
174	.0123	.0172	.1075	.0802	.0105	.0172	.0633	.0370
180	.0010	.0281	.1266	.0896	.0045	.0126	.0610	.0278
186	.0041	.0273	.1159	.0799	-.0014	.0171	.0757	.0400
192	.0129	.0072	.0977	.0756	.0214	.0349	.0639	.0328
198	.0201	.0022	.0891	.0584	.0135	-.0040	.0331	.0082
204	.0002	.0152	.0828	.0402	.0063	.0177	.0480	.0189
210	.0109	.0298	.0879	.0449	.0044	.0222	.0388	.0085
216	-.0041	.0049	.0467	.0172	.0035	.0098	.0217	.0026

TABLE 23 CONTINUED

AZ	CP1	CP2	CP3	CP4	CP1	CP2	CP3	CP4
222	.0008	.0119	.0433	.0229	-.0008	.0125	.0176	.0024
228	-.0017	.0197	.0248	.0065	.0022	.0156	.0123	.0031
234	-.0090	.0085	-.0036	-.0172	-.0051	.0098	.0003	-.0062
240	-.0209	-.0047	-.0289	-.0417	-.0072	.0039	-.0123	-.0070
246	-.0249	.0006	-.0463	-.0571	-.0124	-.0079	-.0271	-.0158
252	-.0201	-.0002	-.0597	-.0760	-.0205	-.0100	-.0274	-.0087
258	-.0214	-.0059	-.0808	-.1009	-.0040	.0012	-.0220	-.0066
264	-.0259	-.0176	-.0980	-.1221	-.0180	-.0200	-.0435	-.0215
270	-.0410	-.0358	-.1182	-.1383	-.0237	-.0191	-.0384	-.0191
276	-.0399	-.0328	-.1170	-.1229	-.0203	-.0221	-.0470	-.0265
282	-.0358	-.0324	-.1158	-.1060	-.0198	-.0255	-.0495	-.0323
288	-.0284	-.0330	-.1004	-.0686	-.0224	-.0218	-.0441	-.0271
294	-.0237	-.0301	-.0847	-.0373	-.0105	-.0240	-.0470	-.0283
300	-.0107	-.0292	-.0668	-.0142	-.0160	-.0246	-.0420	-.0213
306	-.0150	-.0336	-.0619	-.0019	.0016	-.0153	-.0333	-.0147
312	-.0068	-.0341	-.0502	.0087	-.0113	-.0323	-.0472	-.0231
318	.0007	-.0282	-.0400	.0130	-.0030	-.0165	-.0270	-.0077
324	.0138	-.0141	-.0106	.0310	.0126	-.0089	-.0191	-.0057
330	.0183	-.0190	-.0027	.0384	.0094	-.0116	-.0090	.0001
336	.0182	-.0096	.0261	.0521	.0130	-.0031	.0074	.0075
342	.0218	-.0051	.0426	.0523	.0177	.0048	.0239	.0134
348	.0134	-.0034	.0614	.0604	.0101	-.0018	.0277	.0106
354	.0143	.0125	.0936	.0775	.0071	.0097	.0547	.0330
360	.0009	.0216	.1130	.0878	.0081	.0107	.0558	.0279

TABLE 24

UNSTEADY PRESSURE COEFFICIENT VERSUS BLADE AZIMUTH ANGLE

XN/R	H/R	PHI	XB1/R	XB2/R	XB3/R	XB4/R
-1.	.3	225	.62	1.21	1.71	2.26

	ADVANCE RATIO= .15		q= 1.05		ADVANCE RATIO= .20		q= 1.87	
AZ	CP1	CP2	CP3	CP4	CP1	CP2	CP3	CP4
6	.0302	.0440	.1359	.0605	.0201	.0400	.1062	.0421
12	.0720	.0016	.0883	.0368	.0482	.0152	.0357	.0096
18	.0868	-.0120	.0407	.0169	.0528	-.0183	.0052	.0011
24	.0803	-.0110	.0137	.0088	.0416	-.0168	-.0058	-.0039
30	.0834	-.0231	-.0190	-.0041	.0415	-.0162	-.0213	-.0098
36	.0834	-.0338	-.0582	-.0209	.0464	-.0253	-.C166	-.0134
42	.0882	-.0289	-.0776	-.0207	.0421	-.0207	-.0419	-.0125
48	.0720	-.0302	-.1055	-.0312	.0395	-.0197	-.0471	-.0176
54	.0520	-.0511	-.1423	-.0467	.0261	-.0267	-.0578	-.0173
60	.0246	-.0590	-.1554	-.0582	.0131	-.0307	-.0630	-.0227
66	.0125	-.0512	-.1514	-.0543	-.0024	-.0357	-.0711	-.0215
72	.0006	-.0488	-.1360	-.0548	-.0054	-.0261	-.0596	-.0110
78	-.0071	-.0480	-.1221	-.0607	-.0042	-.0233	-.0649	-.0152
84	-.0204	-.0506	-.1107	-.0639	-.0143	-.0234	-.0630	-.0131
90	-.0311	-.0546	-.1043	-.0713	-.0222	-.0234	-.0659	-.0157
96	-.0503	-.0610	-.1024	-.0755	-.0308	-.0322	-.0748	-.0234
102	-.0562	-.0454	-.0810	-.0700	-.0415	-.0252	-.0645	-.0189
108	-.0600	-.0381	-.0728	-.0641	-.0375	-.0199	-.0610	-.0184
114	-.0488	-.0156	-.0484	-.0429	-.0337	-.0121	-.0520	-.0132
120	-.0461	-.0041	-.0330	-.0289	-.0270	-.0004	-.0366	-.0072
126	-.0619	-.0028	-.0255	-.0196	-.0325	-.0009	-.0372	-.0135
132	-.0616	.0078	-.0049	-.0073	-.0439	-.0039	-.0274	-.0124
138	-.0642	.0186	.0247	.0038	-.0342	.0083	-.0086	-.0054
144	-.0508	.0369	.0667	.0272	-.0358	.0152	.0169	-.0030
150	-.0494	.0451	.0982	.0421	-.0215	.0301	.0492	.0090
156	-.0369	.0676	.1680	.0604	-.0205	.0366	.0833	.0194
162	-.0391	.0671	.2081	.0700	-.0113	.0461	.1186	.0256
168	-.0331	.0712	.2402	.0829	-.0190	.0383	.1422	.0318
174	-.0238	.0728	.2706	.0896	-.0109	.0435	.1638	.0475
180	-.0106	.0749	.2470	.0920	-.0061	.0311	.1562	.04J6
186	.0181	.0502	.1649	.0721	.0104	.0382	.1230	.0438
192	.0609	.0055	.0989	.0489	.0413	.0198	.0432	.0134
198	.0694	-.0175	.0412	.0246	.0455	-.0175	.0114	.0010
204	.0613	-.0127	.0107	.0171	.0337	-.0153	-.0017	-.0024
210	.0685	-.0224	-.0225	.0061	.0338	-.0151	-.0167	-.0096
216	.0623	-.0407	-.0673	-.0123	.0361	-.0220	-.0315	-.0126

AZ	CP1	CP2	CP3	CP4	CP1	CP2	CP3	CP4
222	.0707	-.0309	-.0868	-.0116	.0374	-.0185	-.0375	-.0119
228	.0597	-.0316	-.1157	-.0192	.0347	-.0185	-.0419	-.0144
234	.0448	-.0479	-.1504	-.0299	.0226	-.0230	-.0547	-.0169
240	.0185	-.0523	-.1631	-.0388	.0131	-.0278	-.0576	-.0201
246	.0050	-.0468	-.1600	-.0355	-.0054	-.0324	-.0663	-.0185
252	-.0069	-.0463	-.1482	-.0346	-.0074	-.0257	-.0551	-.0099
258	-.0112	-.0415	-.1337	-.0381	-.0041	-.0213	-.0621	-.0142
264	-.0244	-.0471	-.1252	-.0424	-.0166	-.0231	-.0624	-.0110
270	-.0417	-.0546	-.1231	-.0510	-.0231	-.0232	-.0638	-.0140
276	-.0507	-.0559	-.1193	-.0568	-.0309	-.0320	-.0733	-.0203
282	-.0607	-.0476	-.1017	-.0527	-.0421	-.0281	-.0670	-.0197
288	-.0630	-.0372	-.0897	-.0496	-.0355	-.0187	-.0580	-.0170
294	-.0477	-.0130	-.0632	-.0309	-.0336	-.0146	-.0544	-.0152
300	-.0441	-.0048	-.0495	-.0195	-.0285	-.0072	-.0378	-.0080
306	-.0657	-.0090	-.0420	-.0178	-.0296	-.0023	-.0396	-.0117
312	-.0564	.0103	-.0202	-.0039	-.0401	-.0085	-.0314	-.0151
318	-.0619	.0144	.0067	.0020	-.0338	.0056	-.0131	-.0062
324	-.0500	.0353	.0467	.0223	-.0302	.0114	.0128	-.0040
330	-.0484	.0381	.0809	.0360	-.0202	.0253	.0410	.0070
336	-.0371	.0621	.1424	.0556	-.0189	.0305	.0720	.0151
342	-.0356	.0621	.1809	.0579	-.0109	.0399	.1070	.0218
348	-.0326	.0657	.2169	.0695	-.0166	.0296	.1252	.0255
354	-.0264	.0659	.2476	.0777	-.0110	.0382	.1524	.0442
360	-.0088	.0755	.2357	.0816	-.0040	.0257	.1429	.0351

TABLE 25

UNSTEADY PRESSURE COEFFICIENT VERSUS BLADE AZIMUTH ANGLE

XN/R	H/R	PHI	XB1/R	XB2/R	XB3/R	XB4/R
-1.	.3	270	.62	1.21	1.71	2.26

	ADVANCE RATIO= .15		q= 1.05		ADVANCE RATIO= .20		q= 1.87	
AZ	CP1	CP2	CP3	CP4	CP1	CP2	CP3	CP4
6	.0909	.1603	.2513	.0070	.0518	.0662	.2118	.0284
12	.1582	.0899	.1252	-.0190	.0957	.0192	.0947	.0046
18	.1685	.0495	-.0088	-.0425	.1072	-.0214	.0226	-.0087
24	.1709	.0261	-.1095	-.0670	.0925	-.0354	-.0391	-.0154
30	.1739	-.0088	-.1904	-.0963	.1056	-.0359	-.0758	-.0208
36	.1737	-.0283	-.2247	-.1107	.1041	-.0477	-.1092	-.0219
42	.1646	-.0463	-.2353	-.1167	.0989	-.0419	-.1228	-.0211
48	.1373	-.0893	-.2472	-.1314	.0830	-.0440	-.1362	-.0258
54	.0969	-.1644	-.2627	-.1334	.0601	-.0543	-.1515	-.0213
60	.0549	-.2900	-.2638	-.1318	.0340	-.0601	-.1605	-.0253
66	.0267	-.4726	-.2536	-.1153	.0063	-.0600	-.1612	-.0156
72	.0022	-.5788	-.2422	-.1077	-.0015	-.0498	-.1517	-.0044
78	-.0208	-.4801	-.2292	-.0993	-.0115	-.0478	-.1548	-.0068
84	-.0363	-.3181	-.2179	-.0850	-.0230	-.0368	-.1442	-.0014
90	-.0542	-.2415	-.2029	-.0723	-.0366	-.0380	-.1452	-.0061
96	-.0761	-.1974	-.1799	-.0549	-.0521	-.0460	-.1551	-.0217
102	-.0898	-.0939	-.1351	-.0324	-.0677	-.0369	-.1367	-.0182
108	-.0943	-.0108	-.0988	-.0096	-.0629	-.0252	-.1273	-.0276
114	-.0879	.0600	-.0562	.0165	-.0650	-.0127	-.1054	-.0254
120	-.0932	.1005	-.0257	.0331	-.0586	.0041	-.0844	-.0260
126	-.1137	.1225	-.0084	.0440	-.0704	.0064	-.0703	-.0282
132	-.1160	.1582	.0272	.0577	-.0782	.0146	-.0458	-.0140
138	-.1180	.1842	.0743	.0683	-.0733	.0306	-.0057	.0015
144	-.1132	.2084	.1371	.0813	-.0709	.0475	.0491	.0148
150	-.1069	.2307	.2188	.1007	-.0613	.0657	.1154	.0269
156	-.0932	.2549	.3529	.1137	-.0557	.0768	.1983	.0422
162	-.0850	.2597	.4623	.1235	-.0417	.0922	.2953	.0473
168	-.0718	.2545	.5462	.1172	-.0422	.0814	.3714	.0537
174	-.0460	.2523	.6096	.1109	-.0257	.0810	.4152	.0620
180	-.0067	.2452	.5229	.0917	.0025	.0728	.4284	.0553
186	.0592	.1827	.2971	.0604	.0357	.0713	.2592	.0366
192	.1229	.0966	.1349	.0267	.0791	.0206	.1024	.0011
198	.1340	.0554	-.0215	-.0066	.0923	-.0195	.0322	-.0082
204	.1308	.0321	-.1328	-.0224	.0794	-.0355	-.0398	-.0201
210	.1367	.0001	-.2051	-.0474	.0931	-.0337	-.0687	-.0234
216	.1349	-.0182	-.2316	-.0581	.0888	-.0473	-.1052	-.0274

TABLE 25 CONTINUED

AZ	CP1	CP2	CP3	CP4	CP1	CP2	CP3	CP4
222	.1329	-.0351	-.2424	-.0608	.0859	-.0418	-.1184	-.0214
228	.1089	-.0788	-.2628	-.0773	.0754	-.0442	-.1316	-.0246
234	.0797	-.1506	-.2808	-.0797	.0526	-.0530	-.1493	-.0204
240	.0407	-.2731	-.2952	-.0825	.0310	-.0619	-.1581	-.0235
246	.0094	-.4468	-.2873	-.0648	.0042	-.0593	-.1551	-.0117
252	-.0086	-.5221	-.2799	-.0574	-.0033	-.0508	-.1481	-.0005
258	-.0293	-.4315	-.2699	-.0507	-.0128	-.0534	-.1546	-.0057
264	-.0420	-.2872	-.2534	-.0407	-.0265	-.0423	-.1423	-.0001
270	-.0601	-.1998	-.2371	-.0329	-.0361	-.0425	-.1423	-.0046
276	-.0788	-.1358	-.2153	-.0245	-.0538	-.0516	-.1539	-.0211
282	-.0962	-.0519	-.1639	-.0045	-.0677	-.0438	-.1387	-.0210
288	-.0968	.0126	-.1129	.0096	-.0609	-.0310	-.1243	-.0295
294	-.0893	.0703	-.0602	.0302	-.0624	-.0200	-.1083	-.0322
300	-.0925	.0932	-.0282	.0483	-.0582	-.0109	-.0843	-.0337
306	-.1141	.1155	-.0137	.0493	-.0672	-.0028	-.0774	-.0365
312	-.1130	.1462	.0207	.0612	-.0738	.0036	-.0485	-.0222
318	-.1142	.1757	.0626	.0615	-.0710	.0218	-.0159	-.0024
324	-.1065	.1951	.1198	.0695	-.0678	.0334	.0355	.0122
330	-.1037	.2128	.1949	.0794	-.0580	.0549	.0962	.0268
336	-.0894	.2391	.3143	.0928	-.0535	.0632	.1766	.0413
342	-.0791	.2396	.4186	.0885	-.0403	.0788	.2655	.0465
348	-.0681	.2335	.5041	.0815	-.0392	.0662	.3349	.0463
354	-.0385	.2336	.5739	.0752	-.0257	.0690	.3863	.0574
360	.0063	.2376	.5110	.0497	.0052	.0655	.3994	.0486

TABLE 26

UNSTEADY PRESSURE COEFFICIENT VERSUS BLADE AZIMUTH ANGLE

XN/R	H/R	PHI	XB1/R	XB2/R	XB3/R	XB4/R
-1.	.3	315	.62	1.21	1.71	2.26

	ADVANCE RATIO= .15		q= 1.05		ADVANCE RATIO= .20		q= 1.87	
AZ	CP1	CP2	CP3	CP4	CP1	CP2	CP3	CP4
6	.2232	.2565	.7589	.1912	.0983	.1196	.5733	-.0555
12	.2457	.1223	.5076	.1505	.1280	.0570	.3770	-.0558
18	.2091	.0056	.2914	.1212	.1317	.0085	.2245	-.0640
24	.1758	-.1604	.0881	.0928	.1110	-.0157	.0753	-.0615
30	.1520	-.3275	-.0824	.0595	.1302	-.0301	-.0384	-.0680
36	.1321	-.3460	-.1919	.0227	.1238	-.0436	-.1196	-.0644
42	.0848	-.2767	-.2795	-.0131	.1201	-.0476	-.1712	-.0612
48	.0212	-.2418	-.3472	-.0635	.0901	-.0609	-.2117	-.0542
54	-.0555	-.2444	-.3920	-.1113	.0564	-.0782	-.2470	-.0464
60	-.0982	-.2297	-.4140	-.1539	.0212	-.0935	-.2755	-.0368
66	-.0999	-.2051	-.4153	-.1580	-.0077	-.0921	-.2769	-.0093
72	-.0813	-.1799	-.4152	-.1773	-.0163	-.0874	-.2840	.0076
78	-.0681	-.1642	-.4144	-.1862	-.0333	-.0905	-.2918	.0139
84	-.0533	-.1441	-.4039	-.1882	-.0445	-.0776	-.2822	.0253
90	-.0490	-.1244	-.3914	-.1822	-.0537	-.0737	-.2822	.0275
96	-.0505	-.1033	-.3832	-.1744	-.0655	-.0763	-.2884	.0165
102	-.0608	-.0759	-.3593	-.1591	-.0785	-.0687	-.2743	.0199
108	-.0687	-.0433	-.3357	-.1350	-.0747	-.0513	-.2585	.0226
114	-.0723	-.0066	-.3062	-.1118	-.0758	-.0342	-.2380	.0335
120	-.0842	.0148	-.2841	-.1067	-.0725	-.0167	-.2216	.0344
126	-.0900	.0430	-.2521	-.1073	-.0824	-.0065	-.1990	.0371
132	-.0903	.0815	-.2000	-.0954	-.0839	.0107	-.1727	.0329
138	-.0837	.1180	-.1345	-.0787	-.0826	.0254	-.1384	.0241
144	-.0806	.1549	-.0479	-.0218	-.0771	.0510	-.0848	.0226
150	-.0642	.2151	.0943	.0781	-.0734	.0768	-.0008	.0168
156	-.0482	.2645	.3164	.1713	-.0652	.1148	.1435	.0258
162	-.0272	.3122	.5959	.2416	-.0520	.1410	.3449	.0244
168	-.0023	.3303	.9178	.2519	-.0409	.1421	.5979	.0289
174	.0434	.3603	1.2427	.2532	-.0173	.1387	.8347	.0211
180	.1021	.3818	1.2329	.2169	.0325	.1558	1.0072	.0193
186	.1609	.2856	.8828	.1656	.0661	.1500	.6821	-.0346
192	.1792	.1319	.6017	.1341	.1000	.0710	.4125	-.0612
198	.1474	-.0006	.3167	.1062	.1069	.0259	.2409	-.0577
204	.1177	-.1589	.0934	.0835	.0903	-.0117	.0758	-.0658
210	.1027	-.2994	-.0755	.0443	.1120	-.0165	-.0205	-.0656
216	.0933	-.3132	-.1885	.0113	.1042	-.0412	-.1122	-.0640

TABLE 26 CONTINUED

AZ	CP1	CP2	CP3	CP4	CP1	CP2	CP3	CP4
222	.0495	-.2543	-.2875	-.0187	.1068	-.0463	-.1649	-.0584
228	-.0127	-.2192	-.3638	-.0690	.0850	-.0594	-.2073	-.0510
234	-.0886	-.2157	-.4087	-.1109	.0552	-.0789	-.2425	-.0395
240	-.1353	-.2042	-.4247	-.1471	.0205	-.0981	-.2711	-.0302
246	-.1365	-.1810	-.4285	-.1624	-.0078	-.0940	-.2714	-.0000
252	-.1071	-.1646	-.4297	-.1731	-.0172	-.0945	-.2816	.0190
258	-.0920	-.1601	-.4283	-.1708	-.0356	-.1013	-.2948	.0241
264	-.0665	-.1419	-.4188	-.1513	-.0455	-.0827	-.2815	.0421
270	-.0587	-.1293	-.4077	-.1356	-.0533	-.0820	-.2855	.0394
276	-.0592	-.1140	-.4008	-.1191	-.0668	-.0810	-.2897	.0334
282	-.0691	-.0887	-.3793	-.1017	-.0769	-.0738	-.2814	.0318
288	-.0726	-.0561	-.3528	-.0899	-.0741	-.0548	-.2588	.0401
294	-.0802	-.0210	-.3267	-.0862	-.0738	-.0418	-.2415	.0407
300	-.0873	-.0058	-.3010	-.0876	-.0720	-.0304	-.2178	.0464
306	-.0915	.0282	-.2712	-.0819	-.0788	-.0185	-.2002	.0443
312	-.0871	.0582	-.2207	-.0727	-.0792	-.0042	-.1703	.0410
318	-.0750	.1106	-.1568	-.0526	-.0778	.0116	-.1401	.0306
324	-.0710	.1375	-.0791	-.0025	-.0727	.0292	-.0879	.0239
330	-.0547	.1936	.0540	.0933	-.0683	.0575	-.0148	.0162
336	-.0323	.2413	.2556	.1929	-.0619	.0865	.1199	.0223
342	-.0119	.2813	.5147	.2580	-.0472	.1083	.3097	.0210
348	.0137	.2971	.8173	.2826	-.0354	.1010	.5448	.0223
354	.0686	.3410	1.1387	.2959	-.0094	.0927	.7701	.0189
360	.1367	.3702	1.1763	.2504	.0426	.1112	.9426	.0074

TABLE 27

UNSTEADY PRESSURE COEFFICIENT VERSUS BLADE AZIMUTH ANGLE

XN/R	H/R	PHI	XB1/R	XB2/R	XB3/R	XB4/R
-.6	.3	0	.20	.84	1.46	2.26

	ADVANCE RATIO= .10		q= .47		ADVANCE RATIO= .20		q= 1.88	
AZ	CP1	CP2	CP3	CP4	CP1	CP2	CP3	CP4
6	-.0695	.8307	1.5939	.1033	.0923	.2892	.6723	-.0442
12	-.2020	.6687	1.0963	.0495	.0548	.0869	.5133	-.0771
18	-.1028	.4911	.8152	.0147	.0596	.0217	.3817	-.0623
24	.1324	.3894	.6789	-.0029	.0676	.0849	.3471	-.0555
30	.2630	.2760	.3619	-.0151	.0650	.0978	.2545	-.0360
36	.2090	.0993	-.0506	-.0313	.0321	.0456	.1521	-.0121
42	.0901	-.0364	-.3612	-.0506	-.0074	.0032	.0601	.0077
48	-.0262	-.1419	-.5732	-.0901	-.0211	-.0410	-.0119	.0235
54	-.1333	-.2591	-.7044	-.1155	.0094	-.0768	-.0673	.Q302
60	-.1864	-.3325	-.7521	-.1381	.0012	-.1154	-.1241	.0372
66	-.2094	-.4011	-.7665	-.1636	-.0314	-.1308	-.1485	.0455
72	-.2148	-.4563	-.7554	-.1823	-.0363	-.1434	-.1782	.0459
78	-.2253	-.4734	-.7186	-.1807	-.0476	-.1531	-.2041	.0429
84	-.6344	-.5003	-.6999	-.1754	-.0478	-.1518	-.2119	.0488
90	-.6304	-.5228	-.6794	-.1512	-.0638	-.1485	-.2275	.0460
96	-.1053	-.5306	-.6576	-.1255	-.0658	-.1439	-.2490	.0394
102	.1118	-.5493	-.6731	-.1097	-.0725	-.1454	-.2547	.0402
108	.1088	-.5523	-.6702	-.1234	-.0767	-.1443	-.2671	.0328
114	.0484	-.5403	-.6727	-.1409	-.0804	-.1346	-.2660	.0331
120	.0003	-.5275	-.6626	-.1513	-.0736	-.1191	-.2755	.0255
126	-.0426	-.5003	-.6446	-.1304	-.0939	-.1319	-.2863	.0158
132	-.0660	-.4350	-.6044	-.0667	-.0740	-.1358	-.2885	.0093
138	-.0582	-.3266	-.5394	.0444	-.0717	-.0601	-.2989	.0025
144	-.0273	-.1851	-.4549	.1657	-.0547	.0093	-.2898	-.0071
150	.0396	.0014	-.3406	.2671	-.0306	.0436	-.2570	-.0076
156	.1370	.2286	-.1593	.3255	-.0077	.0699	-.2036	-.0116
162	.2573	.4887	.1375	.3256	.0274	.1069	-.1163	-.0218
168	.3544	.7627	.5853	.2890	.0683	.1791	.0574	-.0361
174	.3386	1.0032	1.2224	.2375	.0997	.2728	.3721	-.0435
180	.1217	1.0411	1.8330	.1873	.0965	.3633	.8446	-.0458
186	-.2091	.9342	1.9292	.1373	.0678	.3535	.8078	-.0562
192	-.3639	.7561	1.4267	.0889	.0288	.1320	.6181	-.0624
198	-.1904	.5769	1.0871	.0423	.0523	.0471	.4455	-.0558
204	.1077	.4423	.8906	.0219	.0626	.0915	.3770	-.0516
210	.2535	.3285	.5468	.0152	.0573	.0974	.2844	-.0347
216	.2327	.1387	.1352	.0003	.0313	.0486	.1677	-.0122

TABLE 27 CONTINUED

AZ	CP1	CP2	CP3	CP4	CP1	CP2	CP3	CP4
222	.0981	-.0223	-.1817	-.0235	-.0165	.0087	.0740	.0034
228	-.0368	-.1316	-.3724	-.0540	-.0359	-.0383	.0003	.0207
234	-.1379	-.2344	-.4771	-.0801	.0122	-.0677	-.0571	.0324
240	-.1980	-.3267	-.5043	-.1046	.0132	-.1136	-.1213	.0369
246	-.2221	-.4010	-.5002	-.1344	-.0152	-.1283	-.1499	.0500
252	-.2024	-.4469	-.4790	-.1582	-.0208	-.1404	-.1798	.0505
258	-.2294	-.4797	-.4558	-.1695	-.0426	-.1546	-.2100	.0387
264	-.5922	-.5088	-.4375	-.1734	-.0408	-.1469	-.2154	.0394
270	-.6137	-.5307	-.4357	-.1540	-.0541	-.1491	-.2370	.0341
276	-.1046	-.5536	-.4408	-.1253	-.0631	-.1471	-.2575	.0318
282	.0956	-.5742	-.4478	-.0993	-.0641	-.1493	-.2654	.0291
288	.1023	-.5790	-.4476	-.0893	-.0636	-.1444	-.2739	.0229
294	.0440	-.5792	-.4607	-.1107	-.0732	-.1427	-.2788	.0220
300	-.0143	-.5675	-.4656	-.1201	-.0579	-.1204	-.2795	.0173
306	-.0528	-.5315	-.4597	-.1283	-.0691	-.1315	-.2925	.0108
312	-.0814	-.4710	-.4357	-.0789	-.0625	-.1446	-.2955	.0084
318	-.0545	-.3641	-.3861	.0050	-.0546	-.0850	-.3042	.0050
324	-.0085	-.2188	-.3305	.1050	-.0417	-.0081	-.2924	-.0003
330	.0633	-.0451	-.2424	.2049	-.0201	.0275	-.2680	-.0099
336	.1769	.1665	-.0856	.2861	.0064	.0549	-.2172	-.0195
342	.3142	.4063	.1627	.3113	.0402	.0932	-.1341	-.0260
348	.4260	.6514	.5448	.2811	.0807	.1568	.0258	-.0336
354	.4638	.8812	1.1086	.2368	.1218	.2408	.3283	-.0347
360	.3005	.9297	1.6449	.1778	.1308	.3059	.7716	-.0420

TABLE 28

UNSTEADY PRESSURE COEFFICIENT VERSUS BLADE AZIMUTH ANGLE

XN/R	H/R	PHI	XB1/R	XB2/R	XB3/R	XB4/R
-.6	.3	90	.20	.84	1.46	2.26

	ADVANCE RATIO= .10		q= .46		ADVANCE RATIO= .20		q= 1.85	
AZ	CP1	CP2	CP3	CP4	CP1	CP2	CP3	CP4
6	.4985	.0736	.5002	-.0360	.0344	.0717	.2199	.0662
12	.4629	.1075	.5967	-.0590	-.0296	.0957	.2557	.0574
18	.4016	.1501	.5559	-.0870	-.0647	.1085	.2638	.0479
24	.3306	.1885	.4717	-.0931	-.0921	.1303	.2163	.0276
30	.2592	.2527	.4027	-.0780	-.1223	.1409	.1609	.0024
36	.2236	.2547	.3242	-.0366	-.1217	.1297	.1233	-.0230
42	.1864	.2286	.2162	-.0150	-.1380	.1222	.0893	-.0322
48	.1563	.1997	.1005	-.0103	-.1158	.1128	.0624	-.0421
54	.1477	.1579	-.0061	.0017	-.1135	.0857	.0116	-.0474
60	.1465	.1042	-.0971	.0094	-.1024	.0525	-.0246	-.0464
66	.1530	.0503	-.1591	.0307	-.0909	.0132	-.0561	-.0469
72	.1490	.0006	-.2004	.0326	-.0843	-.0027	-.0678	-.0403
78	.1624	-.0353	-.2219	.0403	-.0647	-.0222	-.0885	-.0352
84	.1656	-.0737	-.2467	.0351	-.0605	-.0369	-.0967	-.0367
90	.1690	-.1005	-.2513	.0305	-.0431	-.0476	-.1026	-.0358
96	.1560	-.1287	-.2629	.0012	-.0308	-.0448	-.0995	-.0354
102	.1604	-.1488	-.2592	-.0128	-.0159	-.0714	-.1134	-.0498
108	.1382	-.1694	-.2595	-.0285	-.0216	-.0765	-.1089	-.0544
114	.1163	-.1846	-.2481	-.0203	.0064	-.0796	-.1021	-.0487
120	.0414	-.2034	-.2446	-.0122	.0191	-.0833	-.1057	-.0441
126	-.1547	-.2210	-.2467	-.0094	.0376	-.0883	-.1023	-.0312
132	-.5731	-.2420	-.2386	.0076	.0613	-.0923	-.1051	-.0263
138	-1.2393	-.2548	-.2295	.0163	.0910	-.0978	-.1098	-.0146
144	-1.6953	-.2410	-.2062	.0166	.0986	-.1141	-.1144	-.0086
150	-1.4012	-.2236	-.1627	-.0194	.1206	-.1102	-.1159	.0102
156	-.5464	-.2041	-.1159	-.0746	.1328	-.1014	-.1070	.0239
162	.0137	-.1540	-.0516	-.0939	.1286	-.0870	-.0875	.0319
168	.2533	-.0704	.0540	-.0794	.1254	-.0640	-.0455	.0472
174	.3592	.0002	.1897	-.0268	.1069	-.0353	.0209	.0594
180	.4322	.0427	.3720	.0056	.0712	.0069	.1080	.0614
186	.4662	.0808	.5578	.0253	.0383	.0624	.2242	.0631
192	.4425	.1272	.6786	.0163	-.0194	.0979	.2681	.0593
198	.3733	.1790	.6678	-.0142	-.0533	.1196	.2882	.0537
204	.3068	.2258	.5604	-.0233	-.0808	.1371	.2309	.0350
210	.2555	.2877	.4539	-.0137	-.1022	.1537	.1848	.0150
216	.2166	.3146	.3586	.0140	-.1057	.1461	.1460	-.0053

TABLE 28 CONTINUED

AZ	CP1	CP2	CP3	CP4	CP1	CP2	CP3	CP4
222	.1882	.2883	.2159	.0272	-.1037	.1315	.1045	-.0217
228	.1561	.2586	.0881	.0300	-.1159	.1246	.0718	-.0440
234	.1443	.2249	-.0325	.0348	-.0985	.0993	.0238	-.0521
240	.1457	.1734	-.1261	.0551	-.1004	.0679	-.0153	-.0527
246	.1467	.1111	-.2067	.0653	-.0810	.0259	-.0471	-.0473
252	.1462	.0663	-.2504	.0613	-.0701	.0067	-.0599	-.0384
258	.1647	.0350	-.2736	.0682	-.0539	-.0159	-.0813	-.0334
264	.1582	-.0078	-.2907	.0662	-.0536	-.0266	-.0920	-.0301
270	.1550	-.0517	-.3041	.0593	-.0344	-.0442	-.1014	-.0286
276	.1438	-.0852	-.3115	.0397	-.0269	-.0399	-.0992	-.0263
282	.1529	-.1194	-.3126	.0228	-.0089	-.0630	-.1119	-.0394
288	.1506	-.1390	-.3125	.0089	-.0057	-.0768	-.1106	-.0414
294	.1079	-.1583	-.3142	-.0046	.0102	-.0777	-.1063	-.0361
300	.0069	-.1766	-.3002	-.0117	.0315	-.0823	-.1010	-.0253
306	-.2102	-.1953	-.2977	-.0113	.0534	-.0873	-.1001	-.0105
312	-.6549	-.2164	-.2924	-.0140	.0769	-.0942	-.1057	-.0078
318	-1.3822	-.2316	-.2750	-.0011	.0998	-.0985	-.1044	.0068
324	-1.8597	-.2259	-.2506	.0056	.1249	-.1119	-.1138	.0085
330	-1.5358	-.2186	-.2171	.0079	.1411	-.1111	-.1106	.0243
336	-.4952	-.2075	-.1667	-.0257	.1479	-.1041	-.0991	.0365
342	.1156	-.1772	-.1000	-.0637	.1416	-.0891	-.0717	.0467
348	.3410	-.1060	.0037	-.0648	.1354	-.0712	-.0373	.0529
354	.4097	-.0294	.1250	-.0784	.1033	-.0427	.0276	.0685
360	.4708	.0285	.2977	-.0352	.0745	-.0039	.1027	.0651

TABLE 29

UNSTEADY PRESSURE COEFFICIENT VERSUS BLADE AZIMUTH ANGLE

XN/R	H/R	PHI	XB1/R	XB2/R	XB3/R	XB4/R
-.6	.3	180	.20	.84	1.46	2.26

	ADVANCE RATIO= .10		q= .46		ADVANCE RATIO= .20		q= 1.85	
AZ	CP1	CP2	CP3	CP4	CP1	CP2	CP3	CP4
6	.0492	.0947	.0166	.0620	.0129	.0391	.0853	.0055
12	.0354	.0931	-.0020	.0643	.0039	.0312	.0413	-.0103
18	.0129	.0891	-.0503	.0557	-.0037	.0067	.0462	-.0230
24	-.0063	.0828	-.0933	.0481	-.0241	.0084	.0282	-.0284
30	-.0135	.0923	-.1059	.0439	-.0244	.0128	.0176	-.0258
36	-.0170	.0993	-.1004	.0300	-.0193	.0110	.0124	-.0185
42	-.0272	.0757	-.1118	.0196	-.0136	.0109	.0042	-.0067
48	-.0465	.0472	-.1185	.0037	-.0219	.0093	-.0002	-.0008
54	-.0494	.0273	-.1052	-.0056	-.0224	.0055	-.0105	-.0010
60	-.0475	-.0101	-.0938	-.0188	-.0209	-.0059	-.0232	-.0005
66	-.0341	-.0438	-.0889	-.0371	-.0132	-.0132	-.0291	.0028
72	-.0208	-.0827	-.1005	-.0521	-.0119	-.0122	-.0261	.0062
78	-.0154	-.1254	-.1109	-.0756	-.0102	-.0098	-.0282	.0080
84	-.0080	-.1676	-.0973	-.0852	-.0005	-.0194	-.0363	.0057
90	-.0084	-.2086	-.0734	-.0871	-.0233	-.0267	-.0440	.0030
96	-.0057	-.2229	-.0180	-.0842	-.0081	-.0230	-.0454	.0008
102	.0209	-.2059	.0288	-.0705	-.0216	-.0335	-.0480	-.0067
108	.0261	-.1902	.0430	-.0533	-.0170	-.0237	-.0406	.0029
114	.0265	-.1511	.0546	-.0312	-.0042	-.0241	-.0381	.0007
120	.0148	-.1097	.0623	-.0257	.0011	-.0179	-.0313	.0114
126	-.0109	-.0807	.0554	-.0169	-.0074	-.0249	-.0383	-.0031
132	-.0328	-.0396	.0578	-.0126	-.0087	-.0232	-.0327	.0055
138	-.0393	-.0074	.0654	-.0011	-.0091	-.0224	-.0289	-.0009
144	-.0303	.0328	.0793	.0204	.0079	-.0130	-.0176	.0039
150	-.0393	.0559	.0836	.0329	.0345	-.0029	-.0022	.0044
156	-.0474	.0724	.0827	.0445	.0299	.0065	.0147	.0067
162	-.0541	.0936	.0853	.0643	.0356	.0058	.0249	.0027
168	-.0466	.1145	.0892	.0757	.0251	.0093	.0422	.0039
174	-.0240	.1329	.0681	.0951	.0265	.0128	.0576	.0037
180	-.0007	.1296	.0286	.1009	.0151	.0191	.0682	.0042
186	.0207	.0998	-.0381	.1010	.0216	.0367	.0865	.0065
192	.0179	.0859	-.0758	.0894	-.0026	.0340	.0478	-.0092
198	-.0074	.0755	-.1166	.0658	-.0065	.0099	.0507	-.0223
204	-.0308	.0683	-.1477	.0381	-.0168	.0082	.0303	-.0315
210	-.0361	.0740	-.1377	.0187	-.0181	.0180	.0249	-.0272
216	-.0385	.0767	-.1190	-.0050	-.0341	.0142	.0182	-.0210

TABLE 29 CONTINUED

AZ	CP1	CP2	CP3	CP4	CP1	CP2	CP3	CP4
222	-.0385	.0467	-.1018	-.0333	-.0185	.0170	.0117	-.0080
228	-.0484	.0108	-.0918	-.0608	-.0193	.0128	.0063	-.0012
234	-.0609	-.0242	-.0734	-.0752	-.0319	.0113	-.0055	-.0032
240	-.0558	-.0630	-.0704	-.0763	-.0152	-.0012	-.0180	-.0043
246	-.0377	-.1037	-.0790	-.0878	-.0323	-.0064	-.0237	.0003
252	-.0244	-.1464	-.0986	-.0933	-.0066	-.0071	-.0220	.0029
258	-.0075	-.1773	-.0743	-.0985	-.0155	-.0075	-.0254	.0051
264	.0036	-.2125	-.0432	-.0969	-.0008	-.0146	-.0335	.0025
270	-.0030	-.2413	-.0079	-.0904	-.0161	-.0219	-.0408	-.0019
276	-.0023	-.2365	.0274	-.0840	-.0094	-.0222	-.0405	.0020
282	.0166	-.2106	.0637	-.0591	-.0113	-.0310	-.0504	-.0120
288	.0374	-.1655	.0694	-.0352	-.0136	-.0206	-.0373	.0036
294	.0481	-.1190	.0736	-.0096	.0009	-.0272	-.0405	-.0032
300	.0353	-.0817	.0739	-.0042	.0000	-.0179	-.0301	.0113
306	.0214	-.0467	.0735	.0066	.0027	-.0276	-.0360	-.0006
312	-.0036	-.0211	.0660	-.0027	-.0067	-.0261	-.0364	.0051
318	-.0103	.0055	.0789	.0039	.0020	-.0240	-.0291	.0003
324	.0106	.0400	.0940	.0113	.0095	-.0127	-.0197	.0019
330	.0069	.0623	.1064	.0182	.0332	-.0056	-.0049	.0047
336	-.0114	.0704	.1120	.0047	.0395	.0024	.0078	.0046
342	-.0182	.0923	.1234	.0060	.0300	.0025	.0215	.0038
348	-.0023	.1105	.1345	.0171	.0201	.0004	.0317	.0004
354	.0224	.1256	.1158	.0336	.0348	.0079	.0507	.0044
360	.0445	.1260	.0870	.0484	.0152	.0121	.0592	.0007

TABLE 30

UNSTEADY PRESSURE COEFFICIENT VERSUS BLADE AZIMUTH ANGLE

XN/R	H/R	PHI	XB1/R	XB2/R	XB3/R	XB4/R
-.6	.3	270	.20	.84	1.46	2.26

	ADVANCE RATIO= .10		q= .46		ADVANCE RATIO= .20		q= 1.85	
AZ	CP1	CP2	CP3	CP4	CP1	CP2	CP3	CP4
6	.0671	.0176	.3677	.0878	.0280	.0870	.1539	.0270
12	.2060	-.0710	.2101	.1480	.0598	.0238	.1056	.0162
18	.2956	-.1501	.0556	.2324	.0758	-.0263	.0308	-.0034
24	.3386	-.1833	-.0644	.3124	.0656	-.0409	-.0167	-.0099
30	.3699	-.1903	-.1494	.3904	.0674	-.0430	-.0475	.0016
36	.3838	-.2118	-.2201	.4517	.0773	-.0453	-.0664	.0135
42	.3688	-.2320	-.2811	.4909	.0868	-.0435	-.0748	.0230
48	.3166	-.2499	-.3263	.5263	.0719	-.0498	-.0979	.0244
54	.2550	-.2466	-.3374	.5697	.0678	-.0661	-.1123	.0220
60	.2099	-.2303	-.3345	.6111	.0630	-.0735	-.1280	.0129
66	.1740	-.2098	-.3347	.6405	.0480	-.0682	-.1214	.0179
72	.1303	-.1922	-.3233	.6730	.0448	-.0525	-.1167	.0185
78	.0859	-.1761	-.3157	.6886	.0327	-.0488	-.1124	.0109
84	.0368	-.1694	-.3039	.6770	.0024	-.0486	-.1186	-.0046
90	-.0183	-.1536	-.2986	.6356	-.0209	-.0482	-.1246	-.0199
96	-.0414	-.1079	-.2634	.6087	-.0328	-.0569	-.1358	-.0398
102	-.0508	-.0702	-.2291	.5558	-.0332	-.0371	-.1090	-.0359
108	-.0707	-.0244	-.1958	.4562	-.0418	-.0234	-.1013	-.0366
114	-.1057	.0158	-.1762	.0789	-.0478	-.0127	-.0895	-.0355
120	-.1281	.0662	-.1433	-.9813	-.0631	.0003	-.0800	-.0438
126	-.1409	.1170	-.0982	-1.8746	-.0836	-.0014	-.0787	-.0471
132	-.1419	.1802	-.0395	-1.5924	-.0835	.0089	-.0594	-.0438
138	-.1487	.2462	.0496	-1.1519	-.0848	.0322	-.0331	-.0352
144	-.1840	.3067	.1580	-.7845	-.0671	.0568	.0166	-.0267
150	-.2730	.3444	.2905	-.5531	-.0687	.0768	.0609	-.0155
156	-.3909	.3706	.4412	-.5360	-.0691	.0921	.1295	-.0058
162	-.4687	.3888	.6243	-.5669	-.0634	.0947	.2015	-.0081
168	-.4429	.3761	.7454	-.4941	-.0641	.0925	.2912	-.0025
174	-.3039	.3201	.7582	-.3359	-.0412	.0969	.3652	.0075
180	-.1193	.1836	.6102	-.1941	-.0103	.1036	.3733	.0180
186	.0576	.0542	.4079	-.0660	.0271	.0919	.2137	.0225
192	.1732	-.0712	.2159	.0153	.0549	.0290	.1159	.0165
198	.2319	-.1643	.0355	.0992	.0652	-.0242	.0425	-.0034
204	.2612	-.2094	-.0965	.1826	.0671	-.0392	-.0153	-.0089
210	.2779	-.2223	-.1865	.2633	.0859	-.0414	-.0408	.0012
216	.3087	-.2482	-.2568	.3300	.0799	-.0457	-.0644	.0076

TABLE 30 CONTINUED

AZ	CP1	CP2	CP3	CP4	CP1	CP2	CP3	CP4
222	.3006	-.2724	-.3209	.3813	.0793	-.0436	-.0708	.0173
228	.2603	-.2957	-.3571	.4352	.0719	-.0493	-.0940	.0187
234	.2062	-.3007	-.3744	.4837	.0673	-.0655	-.1087	.0181
240	.1744	-.2830	-.3689	.5362	.0512	-.0748	-.1260	.0101
246	.1416	-.2616	-.3584	.5853	.0448	-.0672	-.1178	.0227
252	.1031	-.2428	-.3421	.6258	.0374	-.0535	-.1136	.0257
258	.0668	-.2315	-.3339	.6458	.0372	-.0553	-.1134	.0183
264	.0236	-.2172	-.3197	.6453	.0027	-.0509	-.1148	.0101
270	-.0263	-.2016	-.3071	.6345	-.0077	-.0550	-.1236	-.0039
276	-.0521	-.1605	-.2739	.6209	-.0324	-.0620	-.1311	-.0185
282	-.0567	-.1151	-.2392	.5774	-.0483	-.0459	-.1135	-.0169
288	-.0726	-.0609	-.2108	.5304	-.0361	-.0303	-.1027	-.0159
294	-.1074	-.0118	-.1852	.3481	-.0469	-.0186	-.0864	-.0167
300	-.1329	.0348	-.1486	-.3573	-.0533	-.0134	-.0809	-.0219
306	-.1464	.0934	-.0993	-1.4161	-.0660	-.0119	-.0819	-.0217
312	-.1518	.1601	-.0382	-1.6092	-.0841	-.0020	-.0648	-.0290
318	-.1618	.2103	.0489	-1.2758	-.0846	.0220	-.0387	-.0224
324	-.2027	.2720	.1506	-.8668	-.0634	.0457	.0075	-.0156
330	-.2951	.3036	.2822	-.5448	-.0584	.0645	.0494	-.0038
336	-.4337	.3454	.4221	-.4744	-.0669	.0807	.1107	.0029
342	-.5294	.3615	.5920	-.4659	-.0618	.0846	.1812	.0020
348	-.5244	.3475	.7167	-.3656	-.0666	.0760	.2574	.0009
354	-.3895	.3003	.7189	-.2075	-.0384	.0859	.3342	.0147
360	-.1881	.1673	.5889	-.0553	-.0104	.0923	.3466	.0249

TABLE 31

UNSTEADY PRESSURE COEFFICIENT VERSUS BLADE AZIMUTH ANGLE

XN/R	H/R	PHI	XB1/R	XB2/R	XB3/R	XB4/R
-1.	.5	0	.62	1.21	1.71	2.26

	ADVANCE RATIO= .10	q= .47			ADVANCE RATIO= .20	q= 1.86		
AZ	CP1	CP2	CP3	CP4	CP1	CP2	CP3	CP4
6	.0988	.2368	.6706	-.0772	.0851	.1481	.3703	.0823
12	.1190	.2258	.6110	-.0846	.0887	.1210	.2972	.0312
18	.1168	.1807	.4649	-.0825	.0706	.0844	.2223	.0228
24	.1311	.1665	.3600	-.0211	.0415	.0615	.1629	.0111
30	.1278	.1666	.2524	.0502	.0282	.0555	.0980	.0020
36	.1245	.1349	.1199	.1159	.0249	.0458	.0590	-.0031
42	.1068	.0856	-.0090	.1645	-.0016	.0179	.0069	-.0175
48	.0714	.0400	-.1198	.1926	-.0070	.0167	-.0124	-.0124
54	.0520	.0048	-.1899	.2295	-.0224	-.0050	-.0488	-.0212
60	.0290	-.0409	-.2457	.2586	-.0348	-.0315	-.0810	-.0308
66	.0201	-.0763	-.2798	.2640	-.0586	-.0599	-.1127	-.0321
72	.0092	-.1086	-.3044	.2567	-.0527	-.0546	-.1084	-.0131
78	.0110	-.1272	-.3179	.2436	-.0480	-.0642	-.1292	-.0121
84	.0052	-.1580	-.3406	.2163	-.0517	-.0668	-.1318	-.0084
90	-.0134	-.1868	-.3629	.1809	-.0591	-.0769	-.1518	-.0129
96	-.0282	-.1990	-.3709	.1462	-.0549	-.0727	-.1535	-.0205
102	-.0330	-.2002	-.3599	.1249	-.0552	-.0870	-.1730	-.0541
108	-.0422	-.2049	-.3604	.1013	-.0588	-.0780	-.1642	-.0649
114	-.0645	-.2091	-.3527	.0730	-.0489	-.0756	-.1675	-.0879
120	-.0882	-.2062	-.3345	.0430	-.0404	-.0620	-.1569	-.0685
126	-.1170	-.2107	-.3309	-.0099	-.0342	-.0581	-.1556	-.0470
132	-.1490	-.2027	-.3107	-.0473	-.0406	-.0651	-.1596	-.0290
138	-.1719	-.1863	-.2666	-.0757	-.0238	-.0437	-.1362	-.0131
144	-.1728	-.1483	-.1970	-.1017	-.0127	-.0324	-.1073	-.0041
150	-.1628	-.0896	-.1010	-.1090	.0127	-.0113	-.0663	.0090
156	-.1316	-.0180	.0246	-.1231	.0188	.0045	-.0079	.0217
162	-.1175	.0721	.2011	-.1286	.0435	.0385	.0614	.0390
168	-.0724	.1669	.4113	-.1201	.0545	.0563	.1543	.0519
174	-.0340	.2649	.6184	-.1151	.0581	.0794	.2496	.0728
180	.0118	.3181	.7524	-.1056	.0731	.1133	.3956	.0991
186	.0565	.3161	.7776	-.1135	.0710	.1487	.4222	.0966
192	.0775	.2787	.7042	-.1420	.0804	.1296	.3057	.0353
198	.0762	.2279	.5716	-.1413	.0633	.0930	.2534	.0344
204	.0901	.2137	.4442	-.0737	.0365	.0701	.1727	.0195
210	.0985	.2007	.3264	-.0152	.0254	.0665	.1196	.0078
216	.1113	.1784	.1941	.0440	.0212	.0603	.0770	.0076

TABLE 31 CONTINUED

AZ	CP1	CP2	CP3	CP4	CP1	CP2	CP3	CP4
222	.1015	.1237	.0465	.0770	-.0048	.0228	.0166	-.0114
228	.0679	.0717	-.0683	.1021	-.0108	.0268	.0014	-.0027
234	.0473	.0246	-.1487	.1310	-.0225	.0063	-.0401	-.0137
240	.0256	-.0201	-.2123	.1479	-.0349	-.0206	-.0740	-.0190
246	.0252	-.0662	-.2394	.1493	-.0563	-.0489	-.1047	-.0198
252	.0168	-.0978	-.2746	.1271	-.0524	-.0479	-.1036	-.0004
258	.0251	-.1191	-.2839	.0971	-.0461	-.0590	-.1247	-.0031
264	.0176	-.1537	-.3152	.0225	-.0528	-.0628	-.1308	-.0018
270	-.0039	-.1897	-.3425	-.0572	-.0569	-.0759	-.1506	-.0089
276	-.0159	-.2076	-.3493	-.1261	-.0517	-.0706	-.1538	-.0170
282	-.0271	-.2161	-.3541	-.1767	-.0517	-.0844	-.1733	-.0599
288	-.0432	-.2197	-.3505	-.2121	-.0590	-.0824	-.1604	-.0667
294	-.0639	-.2160	-.3416	-.2249	-.0414	-.0752	-.1564	-.0753
300	-.0915	-.2195	-.3285	-.2250	-.0391	-.0720	-.1503	-.0508
306	-.1270	-.2138	-.3211	-.2144	-.0286	-.0609	-.1539	-.0295
312	-.1588	-.2021	-.3028	-.2045	-.0346	-.0710	-.1589	-.0222
318	-.1885	-.1931	-.2563	-.1792	-.0195	-.0518	-.1439	-.0140
324	-.1781	-.1516	-.2064	-.1598	-.0018	-.0374	-.1139	-.0002
330	-.1723	-.1151	-.1045	-.1474	.0177	-.0209	-.0792	.0069
336	-.1399	-.0404	-.0004	-.1442	.0281	-.0071	-.0221	.0207
342	-.1048	.0380	.1666	-.1396	.0524	.0283	.0430	.0380
348	-.0475	.1267	.3512	-.1161	.0616	.0407	.1286	.0478
354	-.0090	.2020	.5404	-.1081	.0657	.0643	.2141	.0652
360	.0427	.2383	.6487	-.1063	.0798	.0974	.3576	.0904

TABLE 32

UNSTEADY PRESSURE COEFFICIENT VERSUS BLADE AZIMUTH ANGLE

XN/R	H/R	PHI	XB1/R	XB2/R	XB3/R	XB4/R
-1.	.5	45	.62	1.21	1.71	2.26

	ADVANCE RATIO= .10		q= .47		ADVANCE RATIO= .20		q= 1.87	
AZ	CP1	CP2	CP3	CP4	CP1	CP2	CP3	CP4
6	.0836	.2495	.4896	.0986	.0418	.0927	.2568	.0900
12	.0648	.2577	.5660	.0582	.0364	.0918	.2206	.0452
18	.0331	.2436	.5608	-.0185	.0156	.0737	.1981	.0353
24	.0084	.2625	.5593	-.0649	-.0157	.0679	.1702	.0373
30	-.0127	.2832	.5210	-.0856	-.0296	.0774	.1371	.0341
36	-.0370	.2552	.4446	-.1258	-.0333	.0847	.1145	.0487
42	-.0574	.1989	.3096	-.1469	-.0474	.0634	.0635	.0503
48	-.0786	.1428	.1994	-.1569	-.0498	.0667	.0537	.0629
54	-.0893	.0978	.1013	-.1364	-.0478	.0545	.0194	.0633
60	-.0992	.0376	.0027	-.1216	-.0568	.0260	-.0138	.0443
66	-.1086	-.0160	-.0784	-.1132	-.0686	-.0049	-.0391	.0198
72	-.0972	-.0521	-.1371	-.0889	-.0668	-.0084	-.0337	.0016
78	-.0958	-.0812	-.1775	-.0752	-.0526	-.0186	-.0432	-.0487
84	-.1110	-.1290	-.2337	-.0723	-.0489	-.0323	-.0470	-.1162
90	-.1101	-.1653	-.2692	-.0579	-.0553	-.0450	-.0511	-.1530
96	-.1089	-.1900	-.2981	-.0458	-.0403	-.0381	-.0638	-.1219
102	-.1046	-.2154	-.3188	-.0409	-.0299	-.0562	-.0928	-.0935
108	-.1023	-.2407	-.3400	-.0389	-.0349	-.0687	-.1173	-.0690
114	-.0780	-.2611	-.3442	-.0317	-.0152	-.0683	-.1336	-.0571
120	-.0567	-.2910	-.3553	-.0243	-.0107	-.0711	-.1252	-.0390
126	-.0403	-.3325	-.3627	-.0224	.0166	-.0645	-.1222	-.0326
132	-.0197	-.3675	-.3617	-.0242	.0209	-.0758	-.1244	-.0294
138	.0180	-.3309	-.3380	-.0069	.0465	-.0645	-.1079	-.0155
144	.0635	-.2036	-.3028	-.0018	.0623	-.0611	-.1023	-.0150
150	.1087	-.0754	-.2573	.0088	.0717	-.0568	-.0832	-.0054
156	.1310	.0412	-.1870	.0350	.0729	-.0554	-.0675	-.0029
162	.1419	.1225	-.0870	.0569	.0844	-.0312	-.0344	.0118
168	.1330	.1803	.0354	.0807	.0803	-.0125	.0138	.0218
174	.1172	.2006	.1836	.1007	.0727	.0080	.0709	.0403
180	.1459	.2202	.3154	.1211	.0735	.0376	.1665	.0621
186	.1378	.1993	.3892	.0923	.0482	.0649	.2254	.0765
192	.0904	.1686	.4653	.0287	.0413	.0812	.1908	.0378
198	.0605	.1811	.4858	-.0391	.0189	.0595	.1679	.0263
204	.0321	.1858	.4889	-.0570	-.0067	.0603	.1526	.0304
210	-.0067	.1749	.4142	-.0655	-.0225	.0697	.1285	.0282
216	-.0273	.1656	.3551	-.0619	-.0241	.0751	.0964	.0393

TABLE 32 CONTINUED

AZ	CP1	CP2	CP3	CP4	CP1	CP2	CP3	CP4
222	-.0402	.1354	.2775	-.0582	-.0429	.0427	.0454	.0377
228	-.0642	.0802	.1736	-.0721	-.0555	.0474	.0408	.0482
234	-.0813	.0300	.0794	-.0742	-.0506	.0334	.0082	.0522
240	-.0989	-.0303	-.0143	-.0788	-.0601	.0135	-.0251	.0452
246	-.1069	-.0811	-.0933	-.0768	-.0704	-.0213	-.0510	.0355
252	-.1180	-.1057	-.1539	-.0851	-.0697	-.0210	-.0556	.0306
258	-.1079	-.1432	-.1908	-.0739	-.0603	-.0261	-.0708	.0019
264	-.1097	-.1626	-.2326	-.0564	-.0548	-.0397	-.0810	-.0617
270	-.1185	-.1991	-.2658	-.0496	-.0618	-.0550	-.0827	-.1306
276	-.1328	-.2284	-.3072	-.0502	-.0515	-.0466	-.0909	-.1762
282	-.1129	-.2396	-.3122	-.0300	-.0400	-.0583	-.1076	-.1638
288	-.0978	-.2660	-.3204	-.0234	-.0431	-.0678	-.1251	-.1303
294	-.0885	-.2830	-.3331	-.0111	-.0265	-.0626	-.1374	-.0942
300	-.0783	-.3020	-.3409	-.0132	-.0229	-.0665	-.1312	-.0609
306	-.0528	-.3163	-.3345	-.0086	.0068	-.0598	-.1235	-.0364
312	-.0260	-.3307	-.3368	-.0180	.0055	-.0725	-.1289	-.0354
318	-.0041	-.3373	-.3325	-.0334	.0222	-.0651	-.1096	-.0229
324	.0320	-.2393	-.2920	-.0089	.0381	-.0629	-.1054	-.0224
330	.0736	-.1180	-.2396	.0041	.0567	-.0507	-.0834	-.0087
336	.0819	-.0004	-.1797	.0125	.0616	-.0467	-.0626	-.0045
342	.0762	.1063	-.0899	.0375	.0713	-.0267	-.0322	.0068
348	.0833	.1723	.0456	.0810	.0679	-.0079	.0179	.0211
354	.1063	.2209	.1898	.1128	.0576	.0118	.0751	.0383
360	.1042	.2523	.3407	.1276	.0583	.0410	.1696	.0642

TABLE 33

UNSTEADY PRESSURE COEFFICIENT VERSUS BLADE AZIMUTH ANGLE

XN/R	H/R	PHI	XB1/R	XB2/R	XB3/R	XB4/R
-1.	.5	90	.62	1.21	1.71	2.26

	ADVANCE RATIO= .10		q= .47		ADVANCE RATIO= .20		q= 1.86
AZ	CP1	CP2	CP3	CP4	CP1	CP2	CP3	CP4
6	.0400	.3493	.2205	.1096	.0137	.0380	.1373	.0662
12	.0008	.3403	.2571	.0805	.0039	.0517	.1058	.0396
18	-.0387	.3293	.2611	.0407	-.0019	.0327	.1185	.0405
24	-.0785	.3157	.2481	-.0015	-.0177	.0369	.0997	.0230
30	-.1062	.3347	.2671	-.0162	-.0311	.0384	.0792	.0131
36	-.1178	.3280	.2374	-.0202	-.0366	.0446	.0700	.0047
42	-.1230	.2805	.1755	-.0457	-.0417	.0353	.0444	.0035
48	-.1396	.2315	.1165	-.0699	-.0426	.0407	.0384	.0049
54	-.1443	.1892	.0516	-.0862	-.0426	.0390	.0236	-.0070
60	-.1468	.1392	-.0044	-.1001	-.0409	.0242	-.0019	-.0160
66	-.1392	.0785	-.0543	-.0994	-.0512	.0030	-.0264	-.0258
72	-.1332	.0249	-.0920	-.1042	-.0467	-.0014	-.0294	-.0248
78	-.1160	-.0329	-.1203	-.1081	-.0411	-.0077	-.0426	-.0295
84	-.1094	-.0952	-.1455	-.1090	-.0391	-.0219	-.0576	-.0386
90	-.0992	-.1533	-.1645	-.1071	-.0413	-.0301	-.0611	-.0367
96	-.0937	-.2052	-.1806	-.1099	-.0302	-.0179	-.0558	-.0310
102	-.0632	-.2424	-.1697	-.0727	-.0232	-.0412	-.0750	-.0406
108	-.0339	-.3245	-.1737	-.0583	-.0167	-.0373	-.0749	-.0311
114	-.0080	-.4237	-.1656	-.0414	-.0081	-.0402	-.0734	-.0262
120	.0206	-.5996	-.1699	-.0305	-.0026	-.0416	-.0689	-.0139
126	.0390	-.7439	-.1846	-.0298	.0163	-.0385	-.0645	-.0135
132	.0614	-.7770	-.1821	-.0317	.0122	-.0518	-.0706	-.0129
138	.0809	-.6880	-.1738	-.0291	.0262	-.0405	-.0567	-.0107
144	.1090	-.4162	-.1573	-.0225	.0276	-.0536	-.0675	-.0088
150	.1292	-.0695	-.1244	-.0105	.0482	-.0356	-.0453	.0008
156	.1419	.1518	-.0856	-.0038	.0436	-.0353	-.0392	.0001
162	.1201	.2239	-.0378	.0085	.0466	-.0234	-.0171	.0121
168	.0922	.2610	.0302	.0348	.0388	-.0180	.0005	.0143
174	.0742	.2950	.1112	.0684	.0281	-.0085	.0282	.0296
180	.0510	.3153	.1990	.1030	.0190	.0056	.0672	.0416
186	.0273	.3154	.2609	.1201	.0129	.0358	.1369	.0626
192	-.0104	.2994	.3031	.1133	.0030	.0561	.1151	.0467
198	-.0557	.2764	.3072	.0800	-.0031	.0357	.1270	.0399
204	-.0928	.2586	.2945	.0550	-.0188	.0438	.1137	.0270
210	-.1118	.2518	.2857	.0429	-.0299	.0437	.0940	.0157
216	-.1223	.2492	.2635	.0331	-.0343	.0521	.0825	.0089

TABLE 33 CONTINUED

AZ	CP1	CP2	CP3	CP4	CP1	CP2	CP3	CP4
222	-.1207	.1987	.2055	.0191	-.0418	.0433	.0570	.0028
228	-.1379	.1398	.1324	-.0037	-.0399	.0467	.0487	.0071
234	-.1450	.0951	.0761	-.0148	-.0404	.0499	.0340	-.0047
240	-.1446	.0413	.0178	-.0242	-.0375	.0354	.0082	-.0145
246	-.1317	-.0266	-.0394	-.0246	-.0451	.0150	-.0193	-.0246
252	-.1226	-.0915	-.0835	-.0286	-.0430	.0071	-.0259	-.0247
258	-.1017	-.1575	-.1167	-.0256	-.0366	.0017	-.0342	-.0244
264	-.0950	-.2396	-.1493	-.0301	-.0367	-.0148	-.0558	-.0381
270	-.0886	-.3294	-.1749	-.0415	-.0345	-.0217	-.0588	-.0325
276	-.0750	-.4066	-.1942	-.0477	-.0264	-.0123	-.0515	-.0213
282	-.0552	-.4385	-.1912	-.0386	-.0143	-.0357	-.0760	-.0375
288	-.0220	-.4871	-.1912	-.0242	-.0136	-.0357	-.0738	-.0243
294	.0074	-.5047	-.1891	-.0117	-.0006	-.0366	-.0736	-.0232
300	.0409	-.5156	-.1887	.0014	.0021	-.0425	-.0694	-.0113
306	.0676	-.4850	-.1937	.0181	.0235	-.0378	-.0641	-.0076
312	.0976	-.4256	-.1959	.0210	.0180	-.0528	-.0730	-.0094
318	.1143	-.2591	-.1900	.0322	.0347	-.0402	-.0575	-.0110
324	.1573	-.0348	-.1708	.0401	.0396	-.0523	-.0688	-.0097
330	.1641	.1583	-.1420	.0540	.0528	-.0365	-.0467	.0004
336	.1731	.2612	-.1149	.0575	.0513	-.0383	-.0414	-.0011
342	.1552	.3021	-.0654	.0601	.0518	-.0261	-.0236	.0104
348	.1417	.3260	-.0010	.0807	.0436	-.0236	-.0074	.0109
354	.1049	.3431	.0722	.0971	.0297	-.0121	.0204	.0284
360	.0783	.3521	.1507	.1118	.0208	-.0002	.0563	.0367

TABLE 34

UNSTEADY PRESSURE COEFFICIENT VERSUS BLADE AZIMUTH ANGLE

XN/R	H/R	PHI	XB1/R	XB2/R	XB3/R	XB4/R
-1.	.5	135	.62	1.21	1.71	2.26

	ADVANCE RATIO= .10	q= .47			ADVANCE RATIO= .20	q= 1.87		
AZ	CP1	CP2	CP3	CP4	CP1	CP2	CP3	CP4
6	.0018	.0946	.1072	.1443	.0053	.0239	.0716	.0336
12	-.0102	.1029	.1668	.1476	.0003	.0387	.0694	.0415
18	-.0409	.0910	.1887	.1259	-.0038	.0171	.0476	.0340
24	-.0588	.0876	.2079	.0917	-.0090	.0167	.0460	.0300
30	-.0656	.1102	.2379	.0787	-.0203	.0087	.0330	.0181
36	-.0684	.1089	.2240	.0650	-.0256	.0206	.0421	.0155
42	-.0764	.0988	.1971	.0459	-.0211	.0241	.0363	.0181
48	-.0731	.0870	.1713	.0226	-.0225	.0190	.0238	.0149
54	-.0826	.0669	.1326	.0014	-.0191	.0239	.0197	.0140
60	-.0866	.0469	.0955	-.0197	-.0130	.0196	.0088	.0096
66	-.0799	.0349	.0691	-.0360	-.0264	-.0004	-.0105	.0027
72	-.0657	.0256	.0426	-.0380	-.0230	-.0011	-.0126	-.0008
78	-.0604	.0013	.0083	-.0361	-.0163	-.0013	-.0177	0.0000
84	-.0641	-.0272	-.0342	-.0394	-.0181	-.0114	-.0263	-.0027
90	-.0563	-.0519	-.0674	-.0383	-.0130	-.0146	-.0310	-.0060
96	-.0464	-.0745	-.1001	-.0378	-.0156	-.0089	-.0278	-.0065
102	-.0317	-.1023	-.1306	-.0343	-.0018	-.0190	-.0350	-.0130
108	-.0212	-.1410	-.1548	-.0345	.0001	-.0219	-.0428	-.0142
114	.0100	-.1763	-.1665	-.0185	-.0048	-.0273	-.0444	-.0158
120	.0249	-.2291	-.1855	-.0018	.0069	-.0257	-.0352	-.0126
126	.0378	-.2712	-.2011	.0091	.0139	-.0267	-.0386	-.0081
132	.0519	-.2766	-.2072	.0233	.0158	-.0279	-.0368	-.0050
138	.0694	-.2412	-.2075	.0364	.0261	-.0234	-.0334	-.0027
144	.0894	-.1818	-.2190	.0453	.0246	-.0267	-.0350	-.0011
150	.0989	-.1147	-.2139	.0551	.0291	-.0235	-.0229	.0028
156	.0940	-.0626	-.2030	.0659	.0255	-.0179	-.0181	.0059
162	.0812	-.0240	-.1859	.0742	.0219	-.0178	-.0147	.0084
168	.0661	.0154	-.1502	.0834	.0190	-.0158	-.0036	.0128
174	.0389	.0476	-.0750	.0943	.0119	-.0056	.0098	.0167
180	.0371	.0739	.0204	.1076	.0021	-.0053	.0246	.0219
186	.0138	.0824	.1001	.1137	.0059	.0151	.0605	.0301
192	-.0081	.0778	.1690	.1091	.0005	.0321	.0649	.0382
198	-.0366	.0801	.2129	.0946	-.0028	.0142	.0388	.0293
204	-.0520	.0785	.2287	.0736	-.0072	.0135	.0424	.0265
210	-.0637	.0890	.2497	.0627	-.0202	.0070	.0310	.0180
216	-.0631	.0945	.2384	.0508	-.0248	.0151	.0344	.0149

TABLE 34 CONTINUED

AZ	CP1	CP2	CP3	CP4	CP1	CP2	CP3	CP4
222	-.0651	.0995	.2291	.0406	-.0219	.0155	.0256	.0167
228	-.0694	.0879	.1950	.0244	-.0241	.0098	.0145	.0107
234	-.0831	.0658	.1510	.0010	-.0222	.0140	.0129	.0102
240	-.0841	.0453	.1159	-.0199	-.0177	.0126	.0037	.0043
246	-.0836	.0306	.0783	-.0386	-.0275	-.0051	-.0162	-.0005
252	-.0863	.0141	.0450	-.0539	-.0248	-.0092	-.0167	-.0034
258	-.0741	.0032	.0268	-.0559	-.0231	-.0104	-.0221	-.0036
264	-.0658	-.0163	-.0107	-.0543	-.0239	-.0190	-.0316	-.0066
270	-.0666	-.0427	-.0489	-.0511	-.0188	-.0199	-.0320	-.0088
276	-.0627	-.0646	-.0845	-.0474	-.0195	-.0174	-.0320	-.0091
282	-.0389	-.0757	-.1048	-.0330	-.0087	-.0229	-.0374	-.0159
288	-.0200	-.0954	-.1233	-.0161	-.0086	-.0251	-.0438	-.0163
294	-.0043	-.1297	-.1539	-.0007	-.0064	-.0283	-.0455	-.0167
300	.0092	-.1506	-.1700	.0150	.0017	-.0268	-.0375	-.0138
306	.0384	-.1675	-.1783	.0335	.0076	-.0291	-.0419	-.0115
312	.0460	-.1809	-.1895	.0482	.0108	-.0253	-.0332	-.0072
318	.0576	-.1673	-.1911	.0578	.0203	-.0234	-.0337	-.0043
324	.0770	-.1255	-.1815	.0709	.0150	-.0297	-.0401	-.0048
330	.0843	-.0845	-.1777	.0828	.0231	-.0237	-.0220	-.0005
336	.0795	-.0536	-.1736	.0891	.0207	-.0166	-.0179	.0036
342	.0581	-.0128	-.1547	.0954	.0197	-.0180	-.0139	.0057
348	.0542	.0240	-.1225	.1059	.0158	-.0130	-.0035	.0103
354	.0340	.0500	-.0676	.1181	.0113	-.0015	.0140	.0159
360	.0210	.0780	.0035	.1301	.0022	.0006	.0287	.0222

TABLE 35

UNSTEADY PRESSURE COEFFICIENT VERSUS BLADE AZIMUTH ANGLE

XN/R	H/R	PHI	XB1/R	XB2/R	XB3/R	XB4/R
-1.	.5	180	.62	1.21	1.71	2.26

	ADVANCE RATIO= .10	q= .47			ADVANCE RATIO= .20	q= 1.86	
AZ	CP1	CP2	CP3	CP4	CP1	CP2	CP3	CP4
6	.0196	-.0054	-.0203	.1320	.0110	.0244	.0603	.0377
12	.0272	-.0138	-.0374	.1073	.0094	.0315	.0511	.0360
18	.0197	-.0168	-.0540	.0688	.0173	.0143	.0235	.0122
24	.0098	-.0225	-.0658	.0241	.0114	.0091	.0242	.0138
30	.0060	-.0269	-.0627	-.0113	.0055	.0034	.0091	.0020
36	.0013	-.0143	-.0344	-.0455	-.0094	-.0005	.0063	.0021
42	.0018	-.0011	-.0202	-.0790	.0011	.0064	.0093	-.0018
48	-.0014	-.0091	-.0127	-.1235	-.0020	-.0012	-.0069	-.0041
54	-.0170	-.0133	-.0110	-.1664	-.0025	.0035	-.0002	-.0058
60	-.0267	-.0175	-.0019	-.1950	-.0069	-.0018	-.0107	-.0092
66	-.0346	-.0170	.0046	-.2127	-.0120	-.0086	-.0191	-.0088
72	-.0343	-.0103	.0195	-.2121	-.0099	-.0098	-.0171	-.0106
78	-.0348	-.0097	.0237	-.2121	-.0131	-.0093	-.0220	-.0113
84	-.0377	-.0131	.0226	-.1927	-.0134	-.0119	-.0215	-.0100
90	-.0486	-.0206	.0178	-.1618	-.0135	-.0170	-.0273	-.0147
96	-.0530	-.0284	.0103	-.1328	-.0156	-.0138	-.0245	-.0129
102	-.0498	-.0205	.0203	-.0885	-.0173	-.0185	-.0308	-.0209
108	-.0497	-.0283	.0126	-.0594	-.0123	-.0131	-.0280	-.0171
114	-.0432	-.0242	.0140	-.0315	-.0158	-.0194	-.0305	-.0163
120	-.0304	-.0234	.0132	-.0016	-.0021	-.0075	-.0195	-.0097
126	-.0302	-.0353	-.0008	.0132	-.0121	-.0201	-.0268	-.0120
132	-.0293	-.0394	-.0098	.0328	-.0029	-.0089	-.0147	-.0057
138	-.0212	-.0325	-.0088	.0513	-.0125	-.0222	-.0242	-.0117
144	-.0150	-.0295	-.0049	.0704	-.0059	-.0117	-.0119	-.0030
150	.0012	-.0160	-.0035	.0950	.0010	-.0068	-.0050	-.0005
156	.0069	-.0133	-.0096	.1044	.0091	.0057	.0113	.0073
162	.0165	-.0026	-.0094	.1208	.0107	.0009	.0091	.0058
168	.0081	.0053	-.0086	.1313	.0057	.0086	.0270	.0150
174	.0082	.0108	-.0166	.1429	.0058	.0098	.0299	.0189
180	.0126	.0235	-.0184	.1479	-.0018	.0071	.0384	.0275
186	.0160	.0198	-.0473	.1350	.0115	.0254	.0609	.0387
192	.0202	.0082	-.0791	.1164	.0082	.0330	.0575	.0393
198	.0101	-.0005	-.1042	.0785	.0155	.0154	.0243	.0135
204	-.0011	-.0096	-.1188	.0371	.0084	.0091	.0304	.0147
210	-.0070	-.0059	-.1044	.0137	.0048	.0073	.0136	.0044
216	-.0086	.0057	-.0779	-.0260	-.0082	.0032	.0125	.0034

TABLE 35 CONTINUED

AZ	CP1	CP2	CP3	CP4	CP1	CP2	CP3	CP4
222	-.0049	.0113	-.0534	-.0604	-.0002	.0087	.0139	.0001
228	-.0081	.0065	-.0334	-.0906	-.0028	.0013	-.0026	-.0023
234	-.0213	.0004	-.0233	-.1298	-.0025	.0062	.0028	-.0053
240	-.0321	-.0009	-.0047	-.1495	-.0066	.0010	-.0077	-.0090
246	-.0356	.0004	.0095	-.1595	-.0107	-.0032	-.0134	-.0083
252	-.0323	.0076	.0276	-.1502	-.0080	-.0057	-.0156	-.0105
258	-.0342	.0085	.0321	-.1361	-.0143	-.0100	-.0205	-.0122
264	-.0352	.0019	.0260	-.1238	-.0113	-.0086	-.0189	-.0086
270	-.0418	-.0060	.0198	-.0992	-.0132	-.0141	-.0260	-.0148
276	-.0505	-.0180	.0110	-.0774	-.0115	-.0120	-.0230	-.0110
282	-.0525	-.0242	.0087	-.0522	-.0171	-.0182	-.0326	-.0230
288	-.0487	-.0262	.0101	-.0241	-.0107	-.0105	-.0247	-.0159
294	-.0352	-.0244	.0103	.0006	-.0136	-.0200	-.0315	-.0181
300	-.0297	-.0282	.0099	.0229	-.0015	-.0070	-.0172	-.0094
306	-.0223	-.0310	.0064	.0450	-.0099	-.0210	-.0270	-.0122
312	-.0186	-.0400	-.0033	.0601	-.0022	-.0110	-.0174	-.0055
318	-.0155	-.0378	-.0034	.0750	-.0107	-.0226	-.0259	-.0148
324	-.0007	-.0361	.0005	.0996	-.0025	-.0118	-.0118	-.0020
330	.0129	-.0221	.0079	.1244	.0045	-.0077	-.0061	-.0037
336	.0136	-.0282	.0058	.1315	.0083	.0022	.0064	.0062
342	.0170	-.0163	.0069	.1482	.0111	-.0007	.0060	.0033
348	.0187	-.0116	.0116	.1542	.0041	.0024	.0184	.0116
354	.0207	-.0052	.0112	.1679	.0078	.0087	.0255	.0175
360	.0215	.0056	.0072	.1682	-.0020	.0020	.0306	.0222

TABLE 36

UNSTEADY PRESSURE COEFFICIENT VERSUS BLADE AZIMUTH ANGLE

XN/R	H/R	PHI	XB1/R	XB2/R	XB3/R	XB4/R
-1.	.5	225	.62	1.21	1.71	2.26

	ADVANCE RATIO= .10	q= .47			ADVANCE RATIO= .20	q= 1.87	
AZ	CP1	CP2	CP3	CP4	CP1	CP2	CP3	CP4
6	.0337	.0336	.0923	.0546	.0216	.0418	.0957	.0577
12	.0447	.0108	.0863	.0445	.0257	.0349	.0343	.0176
18	.0483	-.0004	.0753	.0273	.0284	-.0011	.0138	.0014
24	.0520	-.0113	.0764	.0141	.0143	-.0103	-.0023	-.0090
30	.0495	-.0114	.0861	.0086	.0059	-.0208	-.0196	-.0148
36	.0506	-.0113	.0815	.0010	.0091	-.0147	-.0081	-.0070
42	.0468	-.0106	.0805	-.0062	.0166	-.0040	-.0056	-.0090
48	.0278	-.0247	.0582	-.0203	.0137	-.0096	-.0193	-.0132
54	.0065	-.0393	.0469	-.0319	.0108	-.0136	-.0232	-.0181
60	-.0041	-.0361	.0391	-.0314	.0005	-.0213	-.0328	-.0222
66	-.0108	-.0354	.0332	-.0349	-.0112	-.0276	-.0408	-.0277
72	-.0206	-.0396	.0226	-.0349	-.0111	-.0243	-.0326	-.0201
78	-.0310	-.0431	.0051	-.0431	-.0089	-.0160	-.0304	-.0152
84	-.0444	-.0560	-.0168	-.0468	-.0115	-.0197	-.0293	-.0163
90	-.0603	-.0727	-.0488	-.0604	-.0091	-.0148	-.0343	-.0208
96	-.0715	-.0830	-.0751	-.0572	-.0226	-.0271	-.0419	-.0258
102	-.0791	-.0932	-.1044	-.0551	-.0229	-.0191	-.0337	-.0204
108	-.0833	-.0966	-.1294	-.0541	-.0254	-.0230	-.0375	-.0272
114	-.0853	-.0962	-.1529	-.0542	-.0276	-.0166	-.0271	-.0134
120	-.0859	-.0976	-.1776	-.0562	-.0136	-.0116	-.0216	-.0132
126	-.0813	-.0895	-.1863	-.0550	-.0228	-.0145	-.0240	-.0147
132	-.0808	-.0824	-.1825	-.0411	-.0191	-.0080	-.0154	-.0109
138	-.0752	-.0655	-.1543	-.0231	-.0269	-.0155	-.0164	-.0105
144	-.0681	-.0480	-.1105	-.0049	-.0126	.0016	.0027	-.0035
150	-.0504	-.0161	-.0557	.0132	-.0111	.0039	.0167	.0032
156	-.0414	-.0084	-.0097	.0207	-.0069	.0156	.0336	.0147
162	-.0350	.0166	.0414	.0285	-.0009	.0133	.0336	.0072
168	- 0176	.0324	.0877	.0418	-.0015	.0130	.0482	.0174
174	-.0037	.0408	.1173	.0519	.0029	.0219	.0571	.0199
180	.0171	.0358	.1154	.0430	.0015	.0152	.0642	.0265
186	.0477	.0165	.0975	.0234	.0210	.0334	.0867	.0489
192	.0631	.0048	.0935	.0048	.0270	.0340	.0341	.0185
198	.0660	-.0146	.0743	-.0151	.0314	-.0020	.0076	-.0022
204	.0737	-.0172	.0655	-.0275	.0179	-.0112	-.0024	-.0099
210	.0826	-.0095	.0732	-.0263	.0133	-.0198	-.0177	-.0164
216	.0898	-.0067	.0655	-.0242	.0160	-.0131	-.0098	-.0065

TABLE 36 CONTINUED

AZ	CP1	CP2	CP3	CP4	CP1	CP2	CP3	CP4
222	.0724	-.0097	.0516	-.0343	.0194	-.0058	-.0082	-.0089
228	.0594	-.0115	.0356	-.0385	.0171	-.0140	-.0234	-.0143
234	.0463	-.0151	.0230	-.0344	.0109	-.0178	-.0266	-.0209
240	.0236	-.0217	.0077	-.0380	.0031	-.0210	-.0349	-.0237
246	.0051	-.0205	-.0069	-.0416	-.0082	-.0281	-.0416	-.0274
252	-.0109	-.0203	-.0167	-.0400	-.0091	-.0268	-.0329	-.0181
258	-.0192	-.0213	-.0260	-.0416	-.0096	-.0175	-.0330	-.0166
264	-.0312	-.0242	-.0485	-.0471	-.0105	-.0203	-.0326	-.0179
270	-.0447	-.0355	-.0700	-.0608	-.0081	-.0140	-.0331	-.0195
276	-.0587	-.0404	-.0879	-.0590	-.0195	-.0247	-.0420	-.0252
282	-.0652	-.0448	-.1128	-.0647	-.0264	-.0201	-.0351	-.0203
288	-.0756	-.0519	-.1265	-.0717	-.0234	-.0212	-.0373	-.0262
294	-.0729	-.0470	-.1417	-.0691	-.0277	-.0130	-.0264	-.0122
300	-.0766	-.0476	-.1517	-.0688	-.0127	-.0092	-.0206	-.0142
306	-.0795	-.0489	-.1607	-.0833	-.0222	-.0143	-.0240	-.0151
312	-.0768	-.0383	-.1561	-.0845	-.0177	-.0052	-.0125	-.0077
318	-.0680	-.0213	-.1227	-.0739	-.0267	-.0119	-.0157	-.0112
324	-.0631	-.0092	-.0877	-.0440	-.0165	.0026	.0035	-.0036
330	-.0566	.0046	-.0524	-.0226	-.0112	.0066	.0188	.0056
336	-.0488	.0193	-.0033	.0006	-.0048	.0197	.0368	.0167
342	-.0396	.0398	.0406	.0211	-.0025	.0175	.0376	.0082
348	-.0264	.0525	.0755	.0404	-.0043	.0151	.0538	.0203
354	-.0113	.0617	.0994	.0629	.0033	.0289	.0666	.0249
360	.0114	.0552	.1037	.0601	-.0011	.0194	.0704	.0315

TABLE 37

UNSTEADY PRESSURE COEFFICIENT VERSUS BLADE AZIMUTH ANGLE

XN/R	H/R	PHI	XB1/R	XB2/R	XB3/R	XB4/R
-1.	.5	270	.62	1.21	1.71	2.26

	ADVANCE RATIO= .10		q= .47		ADVANCE RATIO= .20		q= 1.86
AZ	CP1	CP2	CP3	CP4	CP1	CP2	CP3	CP4
6	.0917	.3227	.1456	.1329	.0358	.0622	.1552	.0730
12	.1249	.2889	.0802	.1116	.0579	.0464	.0594	.0157
18	.1466	.2356	-.0017	.0849	.0595	.0040	.0309	.0100
24	.1594	.1917	-.0523	.0606	.0413	-.0100	-.0028	-.0072
30	.1668	.1680	-.0770	.0408	.0451	-.0119	-.0238	-.0102
36	.1758	.1449	-.0900	.0217	.0432	-.0200	-.0362	-.0115
42	.1644	.1015	-.1114	-.0161	.0470	-.0159	-.0447	-.0211
48	.1382	.0589	-.1246	-.0530	.0386	-.0201	-.0560	-.0191
54	.1136	.0203	-.1324	-.0750	.0301	-.0245	-.0607	-.0242
60	.0741	-.0172	-.1443	-.1043	.0104	-.0362	-.0763	-.0340
66	.0452	-.0390	-.1436	-.1219	-.0066	-.0424	-.0848	-.0327
72	.0198	-.0413	-.1364	-.1296	-.0079	-.0357	-.0724	-.0218
78	-.0058	-.0368	-.1339	-.1332	-.0042	-.0219	-.0689	-.0168
84	-.0283	-.0316	-.1351	-.1344	-.0111	-.0279	-.0668	-.0180
90	-.0636	-.0362	-.1604	-.1427	-.0236	-.0241	-.0665	-.0170
96	-.0913	-.0346	-.1679	-.1422	-.0327	-.0348	-.0818	-.0344
102	-.1050	-.0547	-.1551	-.1306	-.0433	-.0284	-.0659	-.0226
108	-.1137	-.1146	-.1473	-.1231	-.0416	-.0282	-.0701	-.0263
114	-.1246	-.2050	-.1282	-.1150	-.0386	-.0124	-.0444	-.0088
120	-.1273	-.3105	-.1053	-.1010	-.0312	-.0065	-.0377	-.0076
126	-.1400	-.4040	-.0784	-.0959	-.0394	-.0043	-.0305	-.0120
132	-.1462	-.3775	-.0359	-.0831	-.0452	-.0082	-.0250	-.0123
138	-.1498	-.2528	.0149	-.0632	-.0479	-.0030	-.0107	-.0055
144	-.1352	-.0713	.0835	-.0266	-.0350	.0142	.0224	-.0001
150	-.1204	.0858	.1577	.0123	-.0288	.0238	.0469	.0141
156	-.1036	.2037	.2218	.0563	-.0120	.0390	.0850	.0237
162	-.0881	.2814	.2849	.1002	-.0126	.0428	.1092	.0328
168	-.0661	.3349	.3291	.1517	-.0041	.0472	.1406	.0416
174	-.0317	.3589	.3295	.1834	-.0030	.0457	.1595	.0538
180	.0126	.3545	.2925	.2032	.0146	.0504	.1767	.0622
186	.0672	.3114	.2064	.2002	.0301	.0643	.1779	.0770
192	.0936	.2620	.1242	.1824	.0488	.0507	.0634	.0218
198	.1059	.2086	.0329	.1545	.0518	.0028	.0403	.0109
204	.1140	.1727	-.0168	.1331	.0352	-.0078	.0002	-.0039
210	.1231	.1475	-.0398	.1150	.0404	-.0129	-.0195	-.0118
216	.1386	.1256	-.0537	.0882	.0366	-.0182	-.0322	-.0114

TABLE 37 CONTINUED

AZ	CP1	CP2	CP3	CP4	CP1	CP2	CP3	CP4
222	.1357	.0872	-.0737	.0632	.0421	-.0173	-.0414	-.0208
228	.1130	.0357	-.0973	.0314	.0321	-.0208	-.0511	-.0175
234	.0792	-.0263	-.1091	.0048	.0267	-.0229	-.0592	-.0233
240	.0489	-.0814	-.1127	-.0171	.0078	-.0384	-.0744	-.0340
246	.0246	-.1355	-.1159	-.0393	-.0082	-.0401	-.0800	-.0300
252	.0009	-.1620	-.1193	-.0536	-.0094	-.0369	-.0715	-.0220
258	-.0170	-.1560	-.1244	-.0636	-.0076	-.0250	-.0675	-.0137
264	-.0352	-.1340	-.1338	-.0759	-.0129	-.0309	-.0694	-.0198
270	-.0683	-.1288	-.1588	-.1026	-.0241	-.0264	-.0666	-.0139
276	-.1005	-.1316	-.1686	-.1158	-.0313	-.0372	-.0817	-.0328
282	-.1144	-.1759	-.1669	-.1162	-.0463	-.0338	-.0705	-.0232
288	-.1219	-.2757	-.1535	-.1104	-.0391	-.0299	-.0708	-.0271
294	-.1278	-.4405	-.1362	-.1050	-.0424	-.0195	-.0500	-.0109
300	-.1308	-.6501	-.1074	-.0961	-.0316	-.0136	-.0402	-.0064
306	-.1346	-.8358	-.0821	-.0896	-.0409	-.0133	-.0376	-.0107
312	-.1421	-.8271	-.0475	-.0881	-.0436	-.0119	-.0309	-.0131
318	-.1472	-.5797	.0059	-.0824	-.0493	-.0125	-.0182	-.0086
324	-.1319	-.2330	.0615	-.0527	-.0345	.0095	.0150	.0017
330	-.1097	.0212	.1375	-.0241	-.0269	.0157	.0355	.0102
336	-.1029	.1824	.1954	.0093	-.0140	.0319	.0734	.0212
342	-.0775	.2810	.2555	.0442	-.0114	.0359	.0963	.0291
348	-.0581	.3362	.2876	.0820	-.0058	.0364	.1205	.0329
354	-.0192	.3722	.2928	.1161	-.0011	.0381	.1421	.0457
360	.0251	.3652	.2527	.1330	.0138	.0419	.1611	.0525

TABLE 38

UNSTEADY PRESSURE COEFFICIENT VERSUS BLADE AZIMUTH ANGLE

XN/R	H/R	PHI	XB1/R	XB2/R	XB3/R	XB4/R
-1.	.5	315	-7.38	.62	1.21	1.71

	ADVANCE RATIO= .10		q= .47		ADVANCE RATIO= .20		q= 1.87	
AZ	CP1	CP2	CP3	CP4	CP1	CP2	CP3	CP4
6	.1171	.1373	.5631	.0876	.0641	.1205	.2581	.0622
12	.1328	.0428	.4093	.0530	.0820	.0757	.1857	.0236
18	.1534	-.0634	.2718	.0389	.0712	.0313	.0950	.0004
24	.1561	-.1221	.1544	.0456	.0411	-.0052	.0309	-.0140
30	.1697	-.1831	.0208	.0362	.0424	-.0020	.0032	-.0161
36	.1665	-.2306	-.0824	.0116	.0408	-.0088	-.0237	-.0137
42	.1485	-.2806	-.1772	-.0142	.0360	-.0215	-.0559	-.0233
48	.1207	-.3078	-.2428	-.0407	.0210	-.0269	-.0732	-.0253
54	.0953	-.3228	-.2888	-.0532	.0155	-.0337	-.0907	-.0331
60	.0700	-.3089	-.3116	-.0679	-.0130	-.0625	-.1232	-.0428
66	.0254	-.2961	-.3328	-.0777	-.0309	-.0710	-.1295	-.0433
72	.0099	-.2576	-.3291	-.0722	-.0352	-.0652	-.1224	-.0335
78	-.0155	-.2059	-.3305	-.0771	-.0300	-.0582	-.1245	-.0290
84	-.0500	-.1650	-.3454	-.0923	-.0323	-.0568	-.1208	-.0357
90	-.0764	-.1203	-.3475	-.0961	-.0454	-.0613	-.1301	-.0393
96	-.1049	-.0620	-.3339	-.0908	-.0534	-.0660	-.1335	-.0420
102	-.1272	-.0087	-.3222	-.0903	-.0593	-.0657	-.1297	-.0407
108	-.1485	.0303	-.3058	-.0910	-.0565	-.0572	-.1146	-.0278
114	-.1682	.0734	-.2706	-.0855	-.0576	-.0520	-.1143	-.0285
120	-.1822	.0930	-.2419	-.0818	-.0511	-.0405	-.0886	-.0097
126	-.1999	.1046	-.1943	-.0822	-.0414	-.0241	-.0769	-.0050
132	-.2034	.1277	-.1413	-.0840	-.0519	-.0290	-.0725	-.0099
138	-.2001	.1233	-.0546	-.0715	-.0499	-.0125	-.0408	.0026
144	-.1916	.1194	.0512	-.0512	-.0280	.0137	-.0030	.0142
150	-.1628	.1041	.1723	-.0153	-.0195	.0259	.0351	.0204
156	-.1461	.1105	.3044	.0190	-.0090	.0445	.0864	.0273
162	-.1093	.1871	.4711	.0668	.0067	.0596	.1400	.0360
168	-.0556	.2464	.6031	.1201	.0179	.0752	.2044	.0417
174	.0053	.2564	.6531	.1459	.0343	.0804	.2592	.0551
180	.0799	.2189	.6025	.1489	.0538	.0894	.3283	.0725
186	.1523	.1564	.5053	.1333	.0660	.1006	.2553	.0550
192	.1644	.0506	.3752	.1120	.0871	.0703	.1597	.0175
198	.1924	-.0327	.2228	.1026	.0837	.0272	.0766	-.0060
204	.2082	-.1028	.1134	.0917	.0556	-.0018	.0270	-.0163
210	.2257	-.1554	.0021	.0821	.0582	-.0013	.0001	-.0180
216	.2225	-.1999	-.0887	.0503	.0571	-.0101	-.0291	-.0143

TABLE 38 CONTINUED

AZ	CP1	CP2	CP3	CP4	CP1	CP2	CP3	CP4
222	.2052	-.2470	-.1670	.0174	.0433	-.0302	-.0657	-.0281
228	.1819	-.2806	-.2408	-.0228	.0220	-.0348	-.0793	-.0336
234	.1298	-.2962	-.2844	-.0526	.0243	-.0386	-.0929	-.0394
240	.1019	-.2996	-.3013	-.0799	-.0036	-.0601	-.1239	-.0506
246	.0558	-.2685	-.3234	-.1027	-.0256	-.0738	-.1327	-.0525
252	.0269	-.2236	-.3198	-.1191	-.0326	-.0688	-.1246	-.0444
258	.0010	-.1783	-.3317	-.1235	-.0323	-.0635	-.1299	-.0382
264	-.0322	-.1218	-.3427	-.1288	-.0304	-.0579	-.1272	-.0424
270	-.0760	-.1006	-.3495	-.1368	-.0475	-.0651	-.1317	-.0412
276	-.0952	-.0385	-.3407	-.1232	-.0513	-.0612	-.1338	-.0414
282	-.1180	.0105	-.3304	-.1212	-.0587	-.0620	-.1292	-.0386
288	-.1396	.0559	-.3070	-.1172	-.0547	-.0524	-.1186	-.0290
294	-.1573	.0902	-.2747	-.1111	-.0593	-.0470	-.1131	-.0265
300	-.1720	.1091	-.2484	-.1172	-.0527	-.0343	-.0883	-.0055
306	-.1854	.1286	-.2049	-.1201	-.0457	-.0252	-.0762	-.0021
312	-.1941	.1356	-.1476	-.1287	-.0546	-.0241	-.0732	-.0101
318	-.1984	.1174	-.0702	-.1225	-.0529	-.0055	-.0372	.0054
324	-.1842	.0938	.0374	-.1009	-.0333	.0208	.0017	.0135
330	-.1640	.0805	.1643	-.0803	-.0219	.0381	.0425	.0218
336	-.1473	.0912	.3154	-.0422	-.0151	.0524	.0964	.0294
342	-.1184	.1681	.4849	.0195	.0008	.0682	.1515	.0387
348	-.0667	.2265	.6149	.0659	.0078	.0798	.2174	.0429
354	-.0150	.2675	.6975	.0982	.0248	.0883	.2774	.0594
360	.0497	.2443	.6781	.1095	.0438	.0997	.3514	.0802

TABLE 39

UNSTEADY PRESSURE COEFFICIENT VERSUS BLADE AZIMUTH ANGLE

XN/R	H/R	PHI	XB1/R	XB2/R	XB3/R	XB4/R
-.6·	.5	0	.62	1.21	1.71	2.26

	ADVANCE RATIO= .10	q= .46			ADVANCE RATIO= .20	q= 1.86	
AZ	CP1	CP2	CP3	CP4	CP1	CP2	CP3	CP4
-----	------	------	------	------	------	------	------	------
6	.0665	.6370	.4238	.4454	.0690	.3718	.1240	.0454
12	.0463	.5988	.3697	.4849	.0727	.2760	.0832	.0351
18	.0002	.4829	.2876	.4827	.0371	.2047	.0533	.0264
24	-.0226	.4078	.2541	.4515	.0285	.1457	.0408	.0257
30	-.0014	.3377	.2171	.4077	.0416	.0855	.0259	.0234
36	.0083	.2191	.1657	.3751	.0364	.0364	.0201	-.0081
42	-.0375	.0994	.0959	.3194	.0286	.0018	.0037	-.0463
48	-.1898	-.0085	.0272	.2517	.0271	-.0240	.0010	-.0489
54	-.3964	-.0940	-.0183	.2015	.0163	-.0578	-.0201	-.0315
60	-.4649	-.1710	-.0536	.1582	-.0035	-.0952	-.0579	-.0181
66	-.3452	-.2378	-.0878	.1153	-.0259	-.1232	-.0814	-.0165
72	-.1943	-.2874	-.1097	.0794	-.0206	-.1174	-.0848	-.0038
78	-.1403	-.3301	-.1364	.0429	-.0278	-.1348	-.0844	.0005
84	-.1402	-.3720	-.1682	-.0130	-.0335	-.1383	-.0738	-.0005
90	-.0820	-.4128	-.2077	-.0791	-.0500	-.1536	-.0771	-.0039
96	-.0013	-.4341	-.2387	-.1266	-.0522	-.1547	-.0671	-.0018
102	.1032	-.4301	-.2529	-.1625	-.0605	-.1677	-.0742	-.0171
108	.1561	-.4306	-.2712	-.2249	-.0545	-.1532	-.0469	.0007
114	.1526	-.4320	-.2965	-.3120	-.0561	-.1527	-.0419	-.0008
120	.1432	-.4084	-.2955	-.4013	-.0363	-.1361	-.0296	.0034
126	.1048	-.3969	-.3039	-.5149	-.0439	-.1338	-.0334	-.0050
132	.0737	-.3611	-.2867	-.6241	-.0444	-.1288	-.0351	-.0087
138	.0454	-.3072	-.2576	-.6513	-.0324	-.1042	-.0268	-.0061
144	.0346	-.2231	-.1998	-.5483	-.0209	-.0802	-.0224	-.0144
150	.0292	-.1154	-.1200	-.4401	-.0099	-.0447	-.0117	-.0068
156	.0232	.0110	-.0237	-.3394	-.0002	.0062	.0078	-.0006
162	.0211	.1767	.0858	-.2116	.0152	.0670	.0314	-.0003
168	.0458	.3883	.2159	-.0472	.0190	.1437	.0598	-.0016
174	.0735	.5893	.3255	.1490	.0278	.2281	.1067	.0093
180	.0842	.7081	.3836	.3300	.0459	.3462	.1650	.0172
186	.0751	.7409	.3720	.4479	.0662	.4090	.1641	.0262
192	.0443	.7038	.2914	.5092	.0776	.2749	.0861	.0244
198	.0114	.5896	.1950	.4991	.0394	.2322	.0755	.0101
204	.0170	.5007	.1381	.4762	.0360	.1569	.0540	.0132
210	.0449	.4207	.0871	.4468	.0455	.1072	.0391	.0127
216	.0625	.2978	.0344	.4100	.0459	.0540	.0316	.0019

TABLE 39 CONTINUED

AZ	CP1	CP2	CP3	CP4	CP1	CP2	CP3	CP4
222	.0361	.1570	-.0307	.3592	.0309	.0097	.0099	-.0217
228	-.0192	.0431	-.0840	.3107	.0314	-.0117	.0068	-.0315
234	-.1544	-.0511	-.1178	.2546	.0252	-.0482	-.0219	-.0418
240	-.3526	-.1285	-.1253	.2025	.0022	-.0871	-.0569	-.0484
246	-.3976	-.1975	-.1305	.1574	-.0169	-.1141	-.0816	-.0372
252	-.2838	-.2515	-.1377	.1123	-.0163	-.1101	-.0746	-.0060
258	-.1525	-.2873	-.1349	.0807	-.0231	-.1292	-.0748	-.0013
264	-.1192	-.3350	-.1532	.0280	-.0276	-.1307	-.0657	-.0028
270	-.0910	-.3828	-.1750	-.0265	-.0470	-.1477	-.0697	-.0050
276	-.0309	-.4018	-.1900	-.0764	-.0449	-.1467	-.0575	.0039
282	.0340	-.4150	-.1916	-.1268	-.0539	-.1643	-.0683	-.0178
288	.0798	-.4171	-.2063	-.1882	-.0589	-.1521	-.0405	-.0004
294	.1189	-.4156	-.2167	-.2599	-.0501	-.1509	-.0387	-.0010
300	.1242	-.4037	-.2203	-.3401	-.0436	-.1357	-.0255	.0057
306	.1223	-.3930	-.2196	-.4279	-.0418	-.1377	-.0269	.0024
312	.1060	-.3668	-.2106	-.5425	-.0460	-.1307	-.0353	-.0035
318	.0870	-.3116	-.1668	-.6321	-.0324	-.1106	-.0268	.0008
324	.0929	-.2494	-.1051	-.6531	-.0207	-.0836	-.0195	.0002
330	.0780	-.1470	-.0212	-.5550	-.0085	-.0554	-.0129	.0035
336	.0829	-.0323	.0687	-.4250	-.0065	-.0065	.0029	.0119
342	.0682	.1317	.1671	-.2730	.0168	.0520	.0273	.0129
348	.0741	.3125	.2970	-.1149	.0108	.1191	.0479	.0110
354	.0887	.4975	.3977	.0936	.0228	.1997	.0919	.0195
360	.0915	.6093	.4545	.2664	.0384	.3124	.1468	.0287

TABLE 40

UNSTEADY PRESSURE COEFFICIENT VERSUS BLADE AZIMUTH ANGLE

XN/R	H/R	PHI	XB1/R	XB2/R	XB3/R	XB4/R
-.6	.5	90	.62	1.21	1.71	2.26

	ADVANCE RATIO= .10		q= .46		ADVANCE RATIO= .20		q= 1.86
AZ	CP1	CP2	CP3	CP4	CP1	CP2	CP3	CP4
6	-.0182	.2240	.0801	.0426	.0141	.1210	.0929	-.0100
12	.0052	.2441	.0723	.0548	.0229	.0950	.0521	-.0258
18	.0057	.2285	.0429	.0427	.0103	.1058	.0598	-.0443
24	.0114	.2045	.0186	.0441	.0059	.0858	.0302	-.0544
30	.0290	.2146	.0174	.0649	.0077	.0781	.0191	-.0483
36	.0697	.1812	.0175	.1022	.0082	.0639	.0054	-.0301
42	.0704	.1252	-.0072	.1574	.0094	.0462	.0032	-.0067
48	.0719	.0777	-.0311	.1796	.0101	.0399	-.0001	.0164
54	.0703	.0288	-.0569	.1572	.0188	.0259	-.0082	.0160
60	.0720	-.0140	-.0663	.1050	.0108	.0002	-.0216	.0216
66	.0707	-.0589	-.0765	.0163	-.0016	-.0243	-.0319	.0189
72	.0731	-.1001	-.0804	-.0431	-.0015	-.0255	-.0243	.0243
78	.0804	-.1393	-.0760	-.1001	-.0035	-.0397	-.0280	.0212
84	.0807	-.1721	-.0790	-.1405	-.0106	-.0535	-.0319	.0169
90	.0692	-.2039	-.0873	-.1597	-.0203	-.0618	-.0349	.0103
96	.0541	-.2220	-.0910	-.1845	-.0045	-.0511	-.0268	.0154
102	.0521	-.2171	-.0734	-.1771	-.0244	-.0750	-.0416	-.0012
108	.0389	-.2130	-.0652	-.1702	-.0183	-.0696	-.0344	.0027
114	.0122	-.1957	-.0505	-.1517	-.0228	-.0713	-.0329	.0025
120	-.0319	-.1843	-.0440	-.1332	-.0175	-.0617	-.0242	.0113
126	-.0832	-.1809	-.0459	-.1214	-.0185	-.0654	-.0242	.0067
132	-.1267	-.1655	-.0432	-.0969	-.0278	-.0682	-.0238	.0089
138	-.1556	-.1512	-.0396	-.0654	-.0201	-.0598	-.0262	.0038
144	-.1629	-.1209	-.0335	-.0435	-.0289	-.0677	-.0259	.0010
150	-.1597	-.0842	-.0153	-.0248	-.0140	-.0479	-.0159	.0054
156	-.1505	-.0492	-.0003	-.0158	-.0169	-.0406	-.0120	.0043
162	-.1496	-.0052	.0090	.0038	-.0073	-.0192	.0037	.0037
168	-.1295	.0593	.0388	.0271	-.0118	-.0060	.0104	.0035
174	-.0953	.1327	.0741	.0423	-.0078	.0208	.0303	.0026
180	-.0676	.2110	.1223	.0572	-.0055	.0529	.0520	-.0007
186	-.0381	.2550	.1495	.0995	.0114	.1186	.0911	-.0015
192	-.0335	.2822	.1613	.1431	.0233	.1043	.0597	-.0145
198	-.0369	.2785	.1396	.1369	.0136	.1157	.0646	-.0370
204	-.0426	.2661	.1125	.1296	.0102	.0991	.0373	-.0564
210	-.0258	.2670	.1101	.1353	.0125	.0912	.0247	-.0661
216	-.0089	.2365	.1002	.1866	.0150	.0823	.0134	-.0576

TABLE 40 CONTINUED

AZ	CP1	CP2	CP3	CP4	CP1	CP2	CP3	CP4
222	-.0173	.1706	.0848	.2675	.0133	.0543	.0072	-.0378
228	-.0442	.1052	.0506	.3113	.0152	.0513	.0050	-.0125
234	-.0480	.0556	.0257	.2694	.0248	.0371	-.0020	-.0042
240	-.0376	.0056	.0030	.2131	.0192	.0122	-.0145	.0078
246	-.0078	-.0425	-.0085	.1183	.0099	-.0144	-.0257	.0148
252	.0330	-.0887	-.0225	.0044	.0066	-.0214	-.0192	.0220
258	.0735	-.1174	-.0233	-.0667	.0050	-.0334	-.0226	.0220
264	.0913	-.1571	-.0342	-.1319	.0014	-.0485	-.0317	.0170
270	.0987	-.1959	-.0508	-.1897	-.0091	-.0576	-.0344	.0100
276	.0863	-.2259	-.0637	-.2165	.0038	-.0477	-.0259	.0208
282	.0898	-.2265	-.0626	-.2309	-.0132	-.0725	-.0440	-.0016
288	.0862	-.2187	-.0590	-.2207	-.0099	-.0671	-.0311	.0031
294	.0746	-.2039	-.0619	-.1970	-.0156	-.0718	-.0344	.0021
300	.0466	-.1932	-.0629	-.1689	-.0146	-.0629	-.0233	.0119
306	.0171	-.1842	-.0719	-.1458	-.0130	-.0656	-.0204	.0105
312	-.0309	-.1716	-.0868	-.1288	-.0242	-.0709	-.0244	.0094
318	-.0771	-.1600	-.0969	-.1075	-.0167	-.0592	-.0240	.0050
324	-.0926	-.1252	-.0916	-.0875	-.0232	-.0686	-.0240	.0020
330	-.1166	-.0920	-.0847	-.0816	-.0112	-.0490	-.0145	.0057
336	-.1097	-.0628	-.0786	-.0878	-.0155	-.0429	-.0122	.0035
342	-.0993	-.0153	-.0668	-.0849	-.0057	-.0239	.0019	.0031
348	-.0835	.0465	-.0321	-.0675	-.0127	-.0132	.0061	-.0020
354	-.0665	.1114	.0063	-.0521	-.0093	.0122	.0280	.0005
360	-.0384	.1787	.0451	-.0217	-.0078	.0404	.0439	-.0108

TABLE 41

UNSTEADY PRESSURE COEFFICIENT VERSUS BLADE AZIMUTH ANGLE

XN/R	H/R	PHI	XB1/R	XB2/R	XB3/R	XB4/R
-.6	.5	180	.62	1.21	1.71	2.26

	ADVANCE RATIO= .10	q= .46			ADVANCE RATIO= .20	q= 1.86	
AZ	CP1	CP2	CP3	CP4	CP1	CP2	CP3	CP4
----	-----	-----	-----	-----	-----	-----	-----	-----
6	.0072	.0407	-.1076	.0633	.0100	.0489	.0476	.0181
12	-.0008	.0408	-.1243	.0631	.0229	.0481	.0445	.0204
18	-.0052	.0439	-.1269	.0483	.0146	.0174	.0181	.0021
24	-.0149	.0313	-.1320	.0351	.0054	.0227	.0197	.0063
30	-.0168	.0324	-.1141	.0260	-.0064	.0005	-.0040	-.0063
36	-.0090	.0489	-.0855	.0113	-.0025	.0094	.0048	-.0014
42	.0023	.0467	-.0519	.0053	.0024	.0032	-.0080	-.0079
48	-.0011	.0361	-.0294	.0016	-.0031	-.0050	-.0062	-.0039
54	-.0046	.0251	-.0119	-.0141	.0009	-.0013	-.0058	-.0088
60	-.0107	.0103	.0009	-.0274	-.0059	-.0138	-.0115	-.0057
66	-.0121	.0034	.0207	-.0430	-.0042	-.0176	-.0140	-.0078
72	-.0050	.0040	.0419	-.0474	-.0112	-.0201	-.0173	-.0052
78	-.0052	-.0021	.0492	-.0694	-.0029	-.0188	-.0152	-.0022
84	-.0101	-.0126	.0588	-.0778	-.0145	-.0273	-.0221	-.0080
90	-.0221	-.0301	.0541	-.0845	-.0099	-.0255	-.0208	-.0047
96	-.0236	-.0433	.0476	-.0845	-.0155	-.0301	-.0264	-.0091
102	-.0204	-.0427	.0518	-.0717	-.0128	-.0297	-.0253	-.0125
108	-.0285	-.0597	.0445	-.0626	-.0155	-.0355	-.0282	-.0169
114	-.0221	-.0630	.0421	-.0458	-.0123	-.0236	-.0172	-.0047
120	-.0204	-.0709	.0400	-.0250	-.0077	-.0241	-.0196	-.0055
126	-.0304	-.0907	.0189	-.0179	-.0121	-.0236	-.0143	-.0030
132	-.0326	-.1011	.0095	.0032	-.0116	-.0205	-.0200	-.0023
138	-.0258	-.1032	.0022	.0194	-.0182	-.0247	-.0132	-.0044
144	-.0235	-.1039	-.0110	.0337	-.0085	-.0175	-.0115	-.0031
150	-.0096	-.0943	-.0200	.0522	-.0084	-.0074	-.0032	-.0017
156	-.0092	-.0823	-.0394	.0662	.0092	.0098	.0111	.0049
162	.0019	-.0588	-.0477	.0901	-.0022	.0052	.0060	-.0033
168	.0002	-.0321	-.0621	.1018	.0079	.0254	.0219	.0131
174	.0108	.0008	-.0618	.1133	-.0008	.0209	.0189	.0003
180	.0214	.0380	-.0593	.1282	.0074	.0359	.0374	.0134
186	.0165	.0481	-.0632	.1263	.0117	.0493	.0497	.0186
192	.0085	.0469	-.0731	.1259	.0229	.0535	.0504	.0198
198	-.0003	.0470	-.0798	.1122	.0147	.0180	.0188	.0073
204	-.0108	.0435	-.0807	.0929	.0045	.0280	.0245	.0061
210	-.0133	.0474	-.0684	.0803	-.0021	.0047	-.0014	-.0066
216	-.0008	.0597	-.0427	.0704	-.0013	.0132	.0056	-.0008

TABLE 41 CONTINUED

AZ	CP1	CP2	CP3	CP4	CP1	CP2	CP3	CP4
222	.0065	.0571	-.0146	.0558	.0051	.0074	-.0031	-.0073
228	.0036	.0410	.0068	.0341	-.0011	-.0009	-.0034	-.0024
234	-.0037	.0297	.0164	.0113	.0022	.0024	-.0052	-.0088
240	-.0041	.0221	.0396	-.0100	-.0049	-.0114	-.0109	-.0069
246	-.0052	.0139	.0530	-.0333	-.0009	-.0120	-.0110	-.0067
252	.0002	.0122	.0656	-.0505	-.0082	-.0182	-.0172	-.0078
258	.0029	.0021	.0724	-.0656	-.0027	-.0160	-.0144	-.0034
264	-.0007	-.0081	.0731	-.0860	-.0113	-.0258	-.0222	-.0087
270	-.0117	-.0265	.0665	-.1020	-.0046	-.0209	-.0194	-.0056
276	-.0230	-.0420	.0584	-.1176	-.0128	-.0288	-.0242	-.0100
282	-.0257	-.0498	.0569	-.1199	-.0141	-.0322	-.0295	-.0152
288	-.0267	-.0544	.0529	-.1161	-.0109	-.0328	-.0249	-.0159
294	-.0256	-.0635	.0464	-.1065	-.0128	-.0250	-.0196	-.0085
300	-.0282	-.0687	.0376	-.0933	-.0086	-.0255	-.0207	-.0080
306	-.0275	-.0763	.0263	-.0764	-.0115	-.0243	-.0148	-.0036
312	-.0333	-.0866	.0108	-.0633	-.0111	-.0224	-.0197	-.0038
318	-.0317	-.0877	-.0007	-.0447	-.0199	-.0272	-.0191	-.0076
324	-.0245	-.0804	-.0034	-.0203	-.0074	-.0168	-.0091	-.0036
330	-.0122	-.0670	-.0095	.0040	-.0081	-.0098	-.0069	-.0050
336	-.0201	-.0649	-.0368	.0092	.0080	.0067	.0104	.0051
342	-.0108	-.0416	-.0504	.0225	-.0046	.0004	.0002	-.0072
348	-.0041	-.0165	-.0654	.0333	.0027	.0188	.0172	.0093
354	.0008	.0084	-.0620	.0517	-.0002	.0181	.0165	.0014
360	.0106	.0322	-.0660	.0669	.0022	.0288	.0308	.0078

TABLE 42

UNSTEADY PRESSURE COEFFICIENT VERSUS BLADE AZIMUTH ANGLE

XN/R	H/R	PHI	XB1/R	XB2/R	XB3/R	XB4/R
-.6	.5	270	.62	1.21	1.71	2.26

	ADVANCE RATIO= .10		q= .46		ADVANCE RATIO= .20		q= 1.86	
AZ	CP1	CP2	CP3	CP4	CP1	CP2	CP3	CP4
6	.0235	.2777	.0845	.0120	.0327	.1456	.0898	.0260
12	.0066	.2028	.0429	.0144	.0434	.0494	.0297	.0183
18	-.0132	.1082	-.0084	.0187	-.0000	.0161	.0123	-.0067
24	-.0298	.0334	-.0465	.0219	-.0057	-.0148	-.0058	-.0052
30	-.0164	.0022	-.0633	.0329	-.0038	-.0332	-.0144	-.0038
36	-.0057	-.0409	-.0759	.0379	-.0013	-.0431	-.0139	-.0033
42	-.0095	-.0933	-.1040	.0350	.0000	-.0504	-.0275	-.0064
48	-.0231	-.1405	-.1280	.0345	.0006	-.0577	-.0272	-.0037
54	-.0219	-.1680	-.1326	.0402	-.0050	-.0642	-.0350	-.0107
60	-.0220	-.1909	-.1383	.0374	-.0194	-.0786	-.0454	-.0172
66	-.0127	-.2018	-.1356	.0266	-.0218	-.0834	-.0460	-.0171
72	-.0038	-.2031	-.1254	.0315	-.0148	-.0709	-.0319	-.0057
78	.0076	-.2031	-.1133	.0315	-.0036	-.0625	-.0278	-.0033
84	.0150	-.2046	-.1005	.0235	-.0105	-.0649	-.0313	-.0089
90	.0054	-.2210	-.0991	.0092	-.0119	-.0652	-.0368	-.0084
96	.0055	-.2121	-.0757	.0035	-.0227	-.0766	-.0511	-.0212
102	.0120	-.1954	-.0365	.0071	-.0212	-.0600	-.0386	-.0167
108	.0105	-.1801	-.0015	.0120	-.0210	-.0598	-.0386	-.0144
114	.0082	-.1752	.0162	.0251	-.0111	-.0362	-.0204	.0002
120	.0023	-.1582	.0410	.0557	-.0060	-.0322	-.0198	-.0015
126	-.0100	-.1420	.0573	.0752	-.0113	-.0235	-.0221	-.0036
132	-.0099	-.1054	.0753	.0940	-.0181	-.0214	-.0245	-.0043
138	-.0070	-.0390	.0955	.1168	-.0149	-.0026	-.0115	.0005
144	.0064	.0471	.1263	.1381	-.0023	.0284	-.0008	-.0005
150	.0123	.1401	.1545	.1568	.0045	.0521	.0175	.0050
156	.0171	.2343	.1808	.1489	.0141	.0830	.0339	.0102
162	.0161	.3348	.1962	.1308	.0145	.1021	.0472	.0066
168	.0241	.4093	.2137	.1052	.0158	.1279	.0656	.0086
174	.0310	.4344	.2166	.0968	.0122	.1402	.0830	.0100
180	.0275	.4007	.1834	.1016	.0249	.1534	.0990	.0167
186	.0123	.3166	.1439	.1076	.0315	.1598	.1042	.0260
192	-.0217	.2148	.0769	.0885	.0430	.0541	.0325	.0223
198	-.0482	.1151	.0125	.0619	-.0001	.0244	.0185	-.0054
204	-.0619	.0404	-.0305	.0415	-.0034	-.0129	-.0027	-.0035
210	-.0606	-.0012	-.0536	.0350	-.0053	-.0270	-.0131	-.0043
216	-.0579	-.0461	-.0792	.0189	-.0027	-.0392	-.0108	-.0048

TABLE 42 CONTINUED

AZ	CP1	CP2	CP3	CP4	CP1	CP2	CP3	CP4
222	-.0626	-.0957	-.1060	.0008	.0009	-.0443	-.0215	-.0059
228	-.0771	-.1446	-.1347	-.0174	-.0025	-.0552	-.0223	-.0045
234	-.0884	-.1819	-.1533	-.0331	-.0054	-.0612	-.0303	-.0112
240	-.0849	-.2031	-.1552	-.0445	-.0206	-.0770	-.0422	-.0190
246	-.0752	-.2112	-.1570	-.0619	-.0211	-.0794	-.0397	-.0177
252	-.0516	-.2129	-.1539	-.0707	-.0161	-.0684	-.0275	-.0072
258	-.0294	-.2111	-.1466	-.0837	-.0070	-.0630	-.0241	-.0043
264	-.0168	-.2106	-.1392	-.1010	-.0123	-.0658	-.0295	-.0102
270	-.0239	-.2266	-.1438	-.1327	-.0144	-.0639	-.0324	-.0095
276	-.0207	-.2212	-.1302	-.1497	-.0227	-.0758	-.0466	-.0206
282	-.0101	-.2104	-.0993	-.1639	-.0264	-.0634	-.0375	-.0152
288	-.0012	-.1970	-.0702	-.1632	-.0192	-.0605	-.0363	-.0151
294	.0030	-.1881	-.0441	-.1544	-.0165	-.0389	-.0207	-.0006
300	-.0030	-.1779	-.0211	-.1385	-.0087	-.0338	-.0159	.0012
306	-.0065	-.1660	.0001	-.1184	-.0174	-.0298	-.0210	-.0016
312	-.0081	-.1386	.0096	-.1153	-.0184	-.0264	-.0266	-.0041
318	-.0116	-.0787	.0268	-.1053	-.0188	-.0088	-.0166	-.0004
324	.0028	-.0092	.0610	-.0674	-.0022	.0215	-.0009	-.0003
330	.0166	.0878	.0848	-.0273	.0019	.0418	.0134	.0055
336	.0195	.1798	.1038	.0038	.0144	.0743	.0286	.0102
342	.0292	.2897	.1217	.0168	.0102	.0904	.0420	.0054
348	.0282	.3601	.1476	.0037	.0127	.1120	.0565	.0067
354	.0408	.3949	.1537	.0063	.0075	.1254	.0733	.0093
360	.0364	.3689	.1391	.0095	.0221	.1412	.0894	.0145
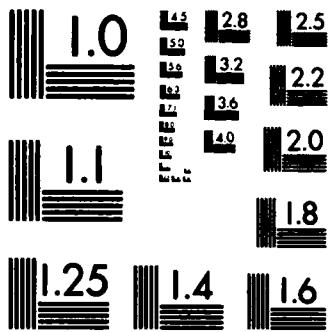
MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

APPENDIX
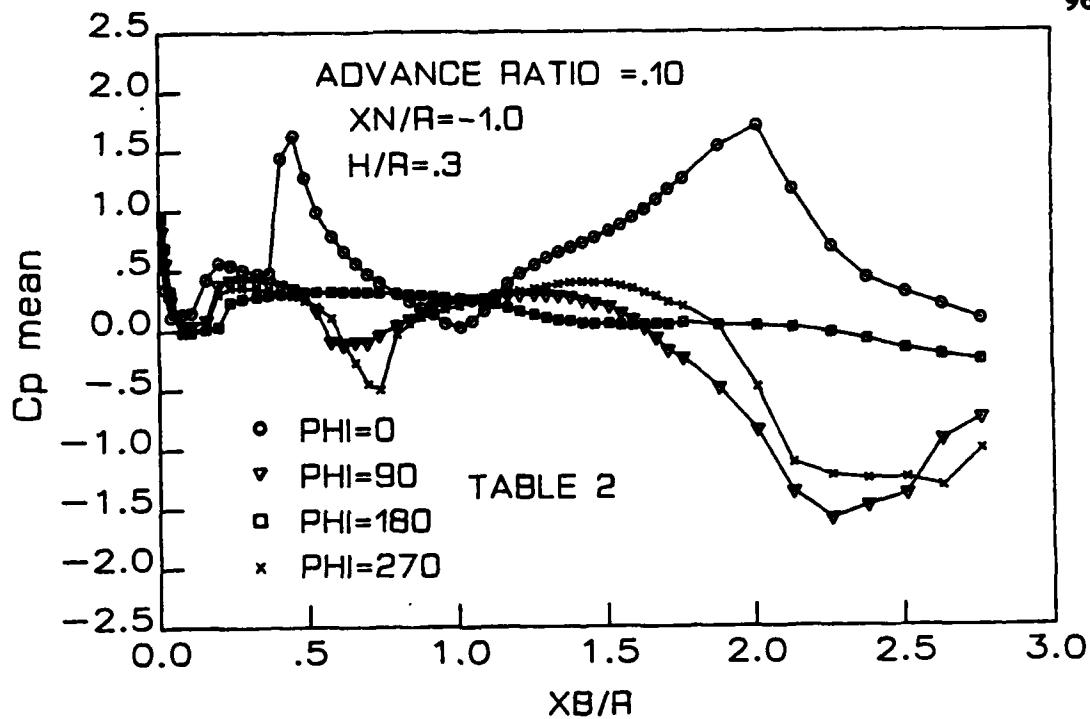
FIG. 5. MEAN SURFACE PRESSURE AT
FOUR PHI LOCATIONS
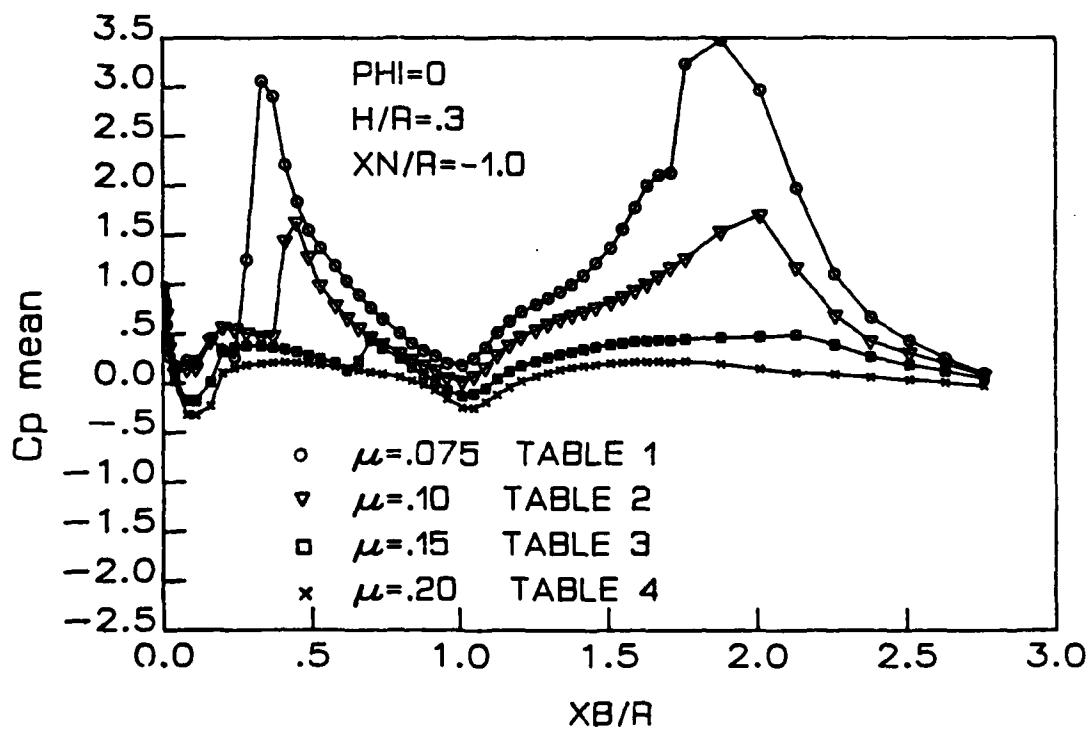
FIG. 6. MEAN SURFACE PRESSURE AT
FOUR ADVANCE RATIOS (μ)
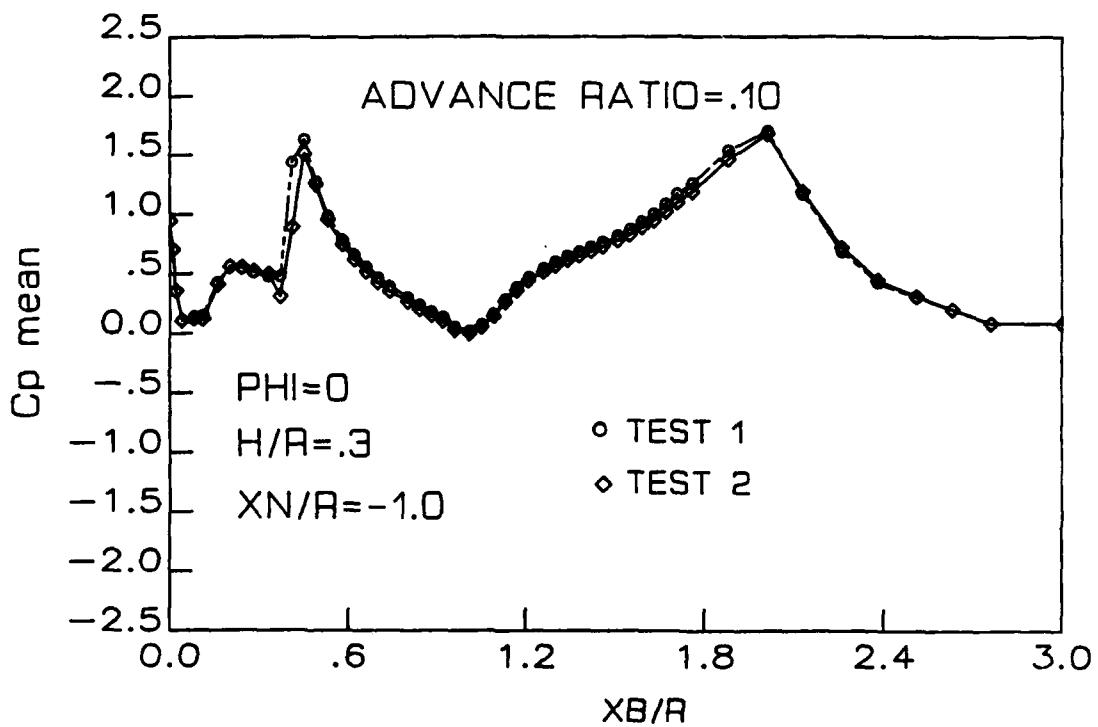
FIG. 7. MEAN PRESSURE DATA REPEATABILITY

FIG. 8. MEAN PRESSURE DATA REPEATABILITY

FIG. 9. UNSTEADY SURFACE PRESSURE AT
FOUR AIRFRAME LOCATIONS
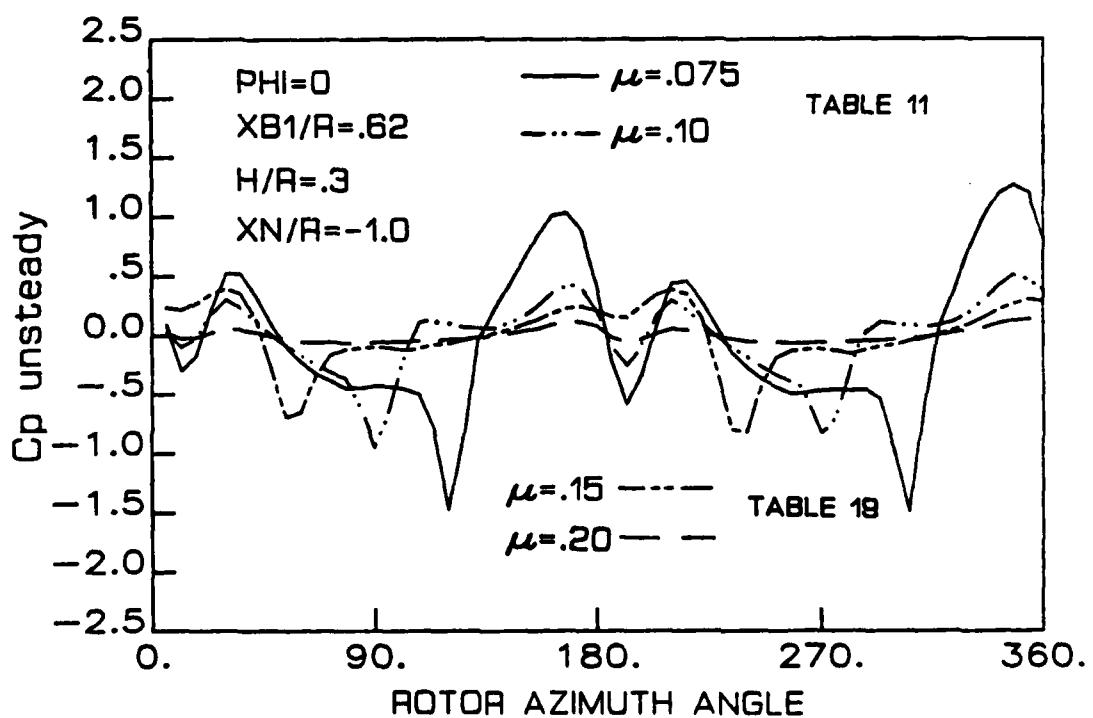
FIG. 10. UNSTEADY SURFACE PRESSURE AT
FOUR ADVANCE RATIOS (μ)
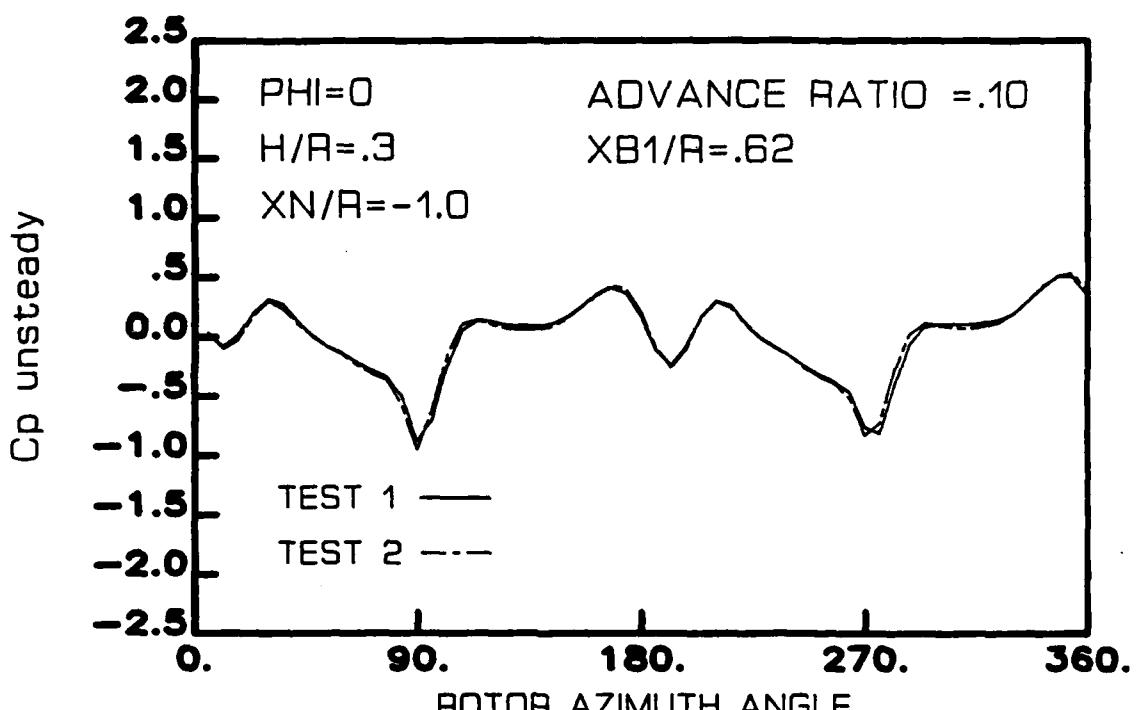
FIG.11. MICROPHONE DATA REPEATABILITY
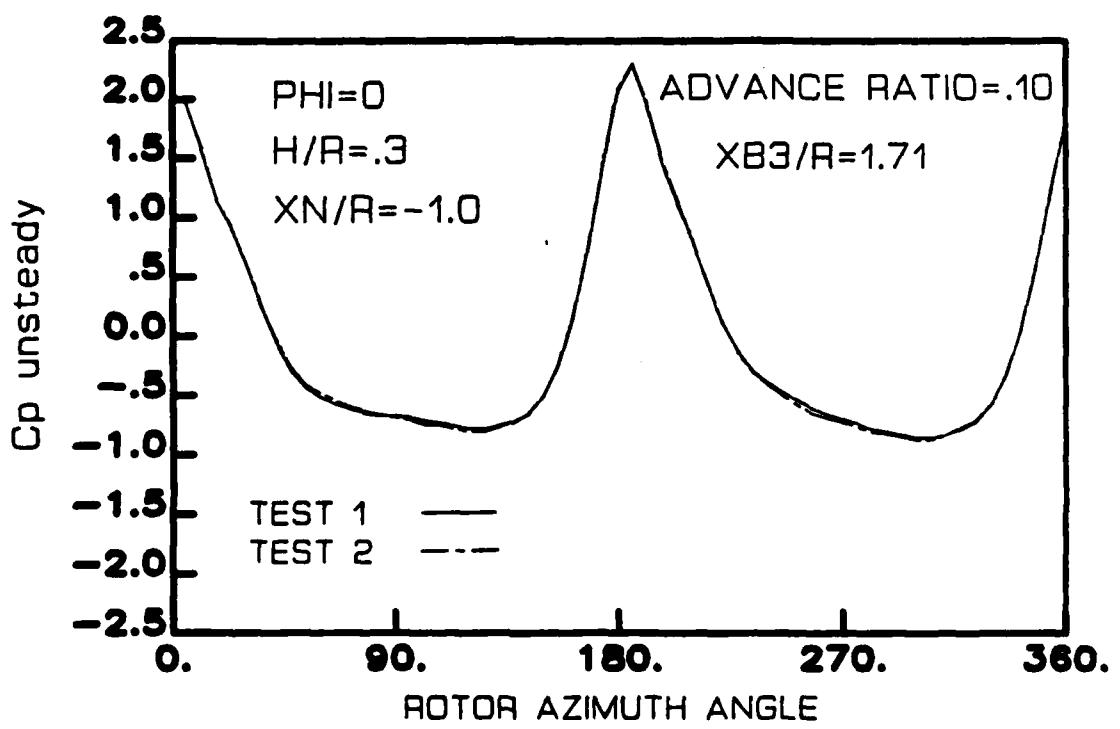
FIG.12. MICROPHONE DATA REPEATABILITY

ACKNOWLEDGEMENTS

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

ADA171333

REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NUMBER ARO 19364.18-EG-RW	2. GOVT ACCESSION NO. NA	3. RECIPIENT'S CATALOG NUMBER NA
4. TITLE (and Subtitle) Wind Tunnel Data From a Rotor Wake/Airframe Interaction Study		5. TYPE OF REPORT & PERIOD COVERED Interim Technical
		6. PERFORMING ORG. REPORT NUMBER
7. AUTHOR(s) A. G. Brand, N. M. Komerath, H. M. McMahon		8. CONTRACT OR GRANT NUMBER(s) DAAG29-82-K-0094
9. PERFORMING ORGANIZATION NAME AND ADDRESS School of Aerospace Engineering Georgia Institute of Technology		10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS NA
11. CONTROLLING OFFICE NAME AND ADDRESS U. S. Army Research Office P. O. Box 12211 Research Triangle Park, NC 27709-2211		12. REPORT DATE July, 1986
		13. NUMBER OF PAGES 100
14. MONITORING AGENCY NAME & ADDRESS(if different from Controlling Office)		15. SECURITY CLASS. (of this report) UNCLASSIFIED
		15a. DECLASSIFICATION/DOWNGRADING SCHEDULE

16. DISTRIBUTION STATEMENT (of this Report)

Approved for public release; distribution unlimited.

17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)

NA

18. SUPPLEMENTARY NOTES
The view, opinions and/or findings contained in this report are those of the author(s) and should not be construed as an official Department of the Army position, policy, or decision, unless so designated by other documentation.

19. KEY WORDS (Continue on reverse side if necessary and identify by block number)

Aerodynamic interaction, Aerodynamic Interference, rotor/body interaction, Rotary wing experiments.

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

This report presents the aerodynamic interaction data base generated in experiments conducted in the John J. Harper 7 x 9 - foot wind tunnel at Georgia Tech. Both time-averaged and unsteady surface pressures on a hemisphere-cylinder airframe are tabulated as a function of rotor-airframe spacing and advance ratio.
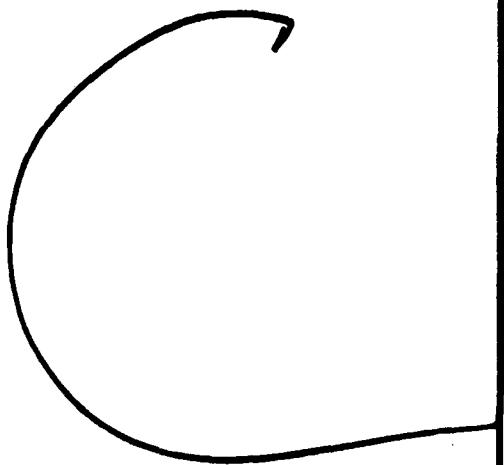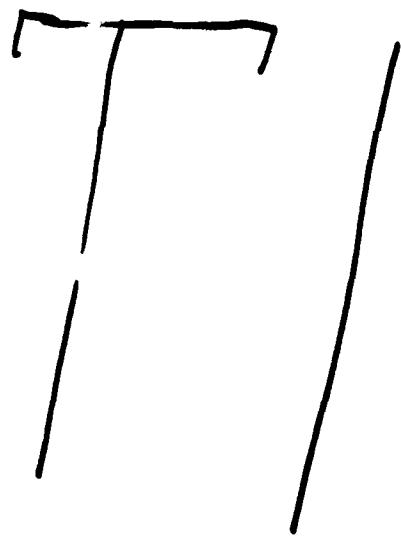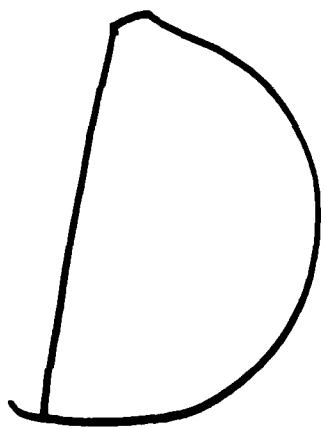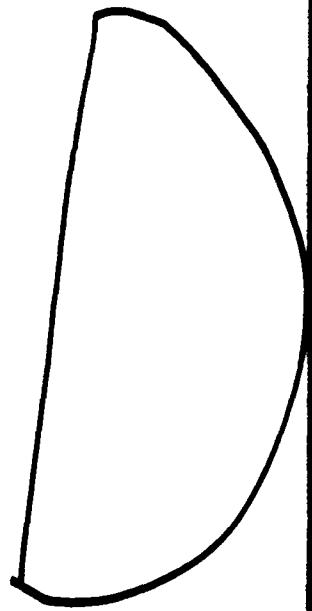
DD FORM 1473 EDITION OF 1 NOV 68 IS OBSOLETE
1 JAN 73

10

END

DTIC

9—86

AD-A171 333 WIND TUNNEL DATA FROM A ROTOR WAKE/AIRFRAME INTERACTION
STUDY(U) GEORGIA INST OF TECH ATLANTA SCHOOL OF
AEROSPACE ENGINEERING   A G BRAND ET AL   JUL 86
UNCLASSIFIED   ARO-19364 18-EG-RW DAAG29-82-K-0094   F/G 1/1   NL
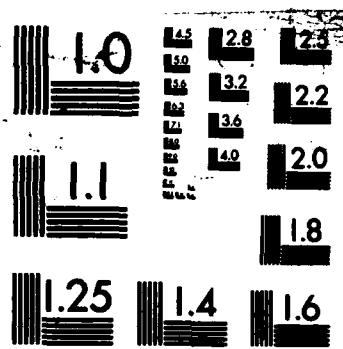
MICROCOPY RESOLUTION TEST CHART

NATIONAL BUREAU OF STANDARDS-1963-A

SUPPLEMENTARY

INFORMATION

ERRATA

Wind Tunnel Data From a Rotor Wake/Airframe Interaction Study

A. G. Brand, N. M. Komerath, H. M. McMahon

July, 1986

Pages 19-22: Tables 5 and 6 are in error. Replace them with the attached
corrected versions.

Issued 11-11-86

TABLE 5

MEAN CP VERSUS XB/R FOR VARYING PHI

XN/R= -1.0   H/R= .5   ADVANCE RATIO= .10

PHI=	0	45	90	135	180	225	270	315
XB/R	CP	CP	CP	CP	CP	CP	CP	CP
0.0000	.9670	.9638	.9675	.9436	.9634	.9671	.9671	.9632
.0100	.7865	.8070	.8512	.8915	.9024	.8865	.8469	.8005
.0200	.4585	.4895	.5559	.6364	.6246	.6018	.5424	.4816
.0400	.1269	.1429	.1894	.2630	.2355	.2106	.1674	.1328
.0800	-.0694	-.0915	-.1103	-.0736	-.1326	-.1473	-.1414	-.1052
.1100	-.0799	-.0982	-.1134	-.0774	-.1353	-.1536	-.1341	-.1114
.1600	.0413	.0115	-.0323	-.0297	-.1084	-.0976	-.0687	-.0118
.2000	.4054	.3270	-.0207	-.0354	-.0686	-.0889	-.0360	.2847
.2400	.4382	.3892	.3028	.2582	.1811	.2084	.2706	.3603
.2800	.4546	.4024	.3089	.2605	.1943	.2141	.2767	.3695
.3300	.4616	.4104	.3203	.2707	.2082	.2250	.2843	.3737
.3700	.4616	.4154	.3295	.2827	.2238	.2379	.2909	.3722
.4100	.4565	.4143	.3352	.2920	.2348	.2477	.2972	.3660
.4500	.4480	.4145	.3410	.2920	.2472	.2594	.2984	.3581
.4900	.4383	.4110	.3434	.3074	.2554	.2660	.2976	.3462
.5300	.4310	.4085	.3453	.3073	.2641	.2727	.2971	.3372
.5800	.4233	.4088	.3468	.3073	.2705	.2767	.2939	.3270
.6200	.4200	.4133	.3508	.3080	.2777	.2816	.2926	.3195
.6600	.4170	.4217	.3537	.3073	.2843	.2853	.2905	.3139
.7000	.4122	.4331	.3586	.3024	.2893	.2884	.2891	.3051
.7400	.3906	.4441	.3624	.2958	.2954	.2915	.2888	.2966
.8000	.2324	.4324	.3653	.2824	.2998	.2947	.2864	.2774
.8400	-.0887	.3447	.3624	.2662	.3020	.2962	.2847	.2384
.8800	.7298	-.0373	.3515	.2383	.3043	.2978	.2810	.1418
.9200	.8530	-.1845	.3195	.1864	.3070	.3009	.2785	-.1218
.9600	.7410	.3938	.2452	.0864	.3069	.2998	.2684	-.4517
1.0100	.6305	.6611	.1017	-.0257	.3049	.2997	.2512	-.3901
1.0500	.5819	.7229	-.1014	-.1012	.3044	.2993	.2256	-.2213
1.0900	.5324	.7122	-.2659	-.2096	.3002	.2969	.1663	-.0963
1.1300	.5353	.7181	-.1884	-.1945	.2975	.2951	.0603	.0176
1.1700	.5306	.7142	-.1089	-.1124	.2936	.2908	-.0171	.0775
1.2100	.5390	.7110	-.0380	-.0248	.2874	.2862	-.0500	.1250
1.2600	.5507	.7138	.0321	.0359	.2798	.2784	-.1042	.1667
1.3000	.5556	.7178	.0604	.0699	.2729	.2720	-.2110	.1956
1.3400	.5615	.7181	.0900	.0898	.2632	.2634	-.1198	.2219
1.3800	.5662	.7173	.1092	.0984	.2559	.2507	-.0021	.2412

TABLE 5 CONTINUED

PHI=	0	45	90	135	180	225	270	315
XB/R	CP	CP	CP	CP	CP	CP	CP	CP
1.4200	.5688	.7055	.1035	.0885	.2425	.2358	.0689	.2623
1.4600	.5716	.6945	.1007	.0832	.2301	.2191	.1134	.2753
1.5100	.5831	.6867	.0963	.0740	.2197	.2021	.1525	.2890
1.5500	.5824	.6599	.0587	.0444	.1999	.1790	.1813	.2860
1.5900	.5833	.6367	.0353	.0248	.1834	.1658	.2191	.2798
1.6300	.5790	.5977	.0045	.0065	.1611	.1537	.2388	.2679
1.6700	.5826	.5466	−.0350	−.0175	.1379	.1468	.2530	.2658
1.7100	.5888	.4788	−.0911	−.0490	.1109	.1446	.2384	.2406
1.7600	.5941	.4384	−.1146	−.0601	.0961	.1419	.2398	.2490
1.8800	.5988	.1907	−.2811	−.1382	.0341	.1438	.1838	.2110
2.0100	.6029	−.0564	−.4719	−.2010	−.0150	.1440	.1147	.1669
2.1300	.7749	−.2633	−.6038	−.2091	−.0692	.1234	.0310	.1091
2.2600	.8704	−.5184	−.6269	−.1932	−.1092	.0917	−.0554	.0339
2.3800	.8760	−.7913	−.6955	−.3117	−.1270	.0658	−.1629	−.0230
2.5100	.6810	−.8844	−.8593	−.3562	−.1186	.0398	−.3625	.1106
2.6300	.5031	−.8553	−.9410	−.2920	−.1165	−.0121	−.5172	.0450
2.7600	.3085	−.7269	−.9174	−.2744	−.1418	−.0734	−.6553	−.0899

TABLE 6

MEAN CP VERSUS XB/R FOR VARYING PHI

XN/R= -1.0   H/R= .5   ADVANCE RATIO= .20

PHI=	0	45	90	135	180	225	270	315
XB/R	CP	CP	CP	CP	CP	CP	CP	CP
0.0000	.9874	.9865	.9855	.9564	.9843	.9833	.9863	.9858
.0100	.8283	.8416	.8528	.8265	.8531	.8408	.8260	.8242
.0200	.4570	.4703	.4903	.4742	.4855	.4627	.4424	.4467
.0400	.0014	.0037	.0189	.0138	.0076	-.0184	-.0377	-.0207
.0800	-.3906	-.4026	-.4083	-.4144	-.4363	-.4538	-.4589	-.4268
.1100	-.3989	-.4046	-.4073	-.4149	-.4336	-.4568	-.4489	-.4252
.1600	-.3340	-.3452	-.3686	-.3861	-.4193	-.4313	-.4218	-.3848
.2000	.0222	.0160	-.0269	-.0581	-.0860	-.0829	-.0449	-.0078
.2400	.0532	.0402	.0031	-.0268	-.0427	-.0405	-.0159	.0204
.2800	.0850	.0712	.0316	.0009	-.0134	-.0100	.0133	.0518
.3300	.1050	.0918	.0511	.0203	.0060	.0104	.0331	.0712
.3700	.1196	.1063	.0667	.0352	.0213	.0254	.0477	.0844
.4100	.1282	.1158	.0767	.0449	.0310	.0360	.0574	.0930
.4500	.1365	.1249	.0877	.0449	.0422	.0470	.0676	.1005
.4900	.1361	.1266	.0907	.0631	.0468	.0514	.0693	.0997
.5300	.1363	.1275	.0943	.0631	.0524	.0568	.0725	.0999
.5800	.1307	.1246	.0939	.0633	.0541	.0583	.0720	.0968
.6200	.1271	.1237	.0960	.0663	.0583	.0620	.0733	.0931
.6600	.1211	.1202	.0957	.0672	.0607	.0638	.0734	.0884
.7000	.1146	.1204	.0988	.0678	.0634	.0655	.0718	.0830
.7400	.1080	.1147	.0961	.0681	.0663	.0675	.0715	.0775
.8000	.0977	.1101	.0953	.0689	.0682	.0684	.0696	.0704
.8400	.0879	.1047	.0927	.0670	.0677	.0676	.0664	.0628
.8800	.0811	.1012	.0914	.0665	.0683	.0673	.0650	.0587
.9200	.0800	.1034	.0943	.0687	.0723	.0714	.0681	.0598
.9600	.0720	.0997	.0917	.0669	.0704	.0692	.0652	.0547
1.0100	.0707	.1006	.0925	.0669	.0710	.0698	.0656	.0547
1.0500	.0761	.1017	.0962	.0697	.0741	.0733	.0691	.0609
1.0900	.0752	.1068	.0932	.0676	.0714	.0713	.0680	.0615
1.1300	.0862	.1156	.0973	.0694	.0745	.0744	.0726	.0692
1.1700	.0946	.1216	.0994	.0695	.0748	.C752	.0749	.0752
1.2100	.1026	.1276	.0998	.0688	.0743	.0755	.0766	.0814
1.2600	.1134	.1345	.1021	.0691	.0754	.0770	.0806	.0888
1.3000	.1231	.1408	.1032	.0693	.0755	.0782	.0833	.0955
1.3400	.1326	.1477	.1048	.0699	.0762	.0796	.0856	.1022
1.3800	.1417	.1538	.1061	.0700	.0770	.0809	.0879	.1081

TABLE 6 CONTINUED

PHI=	0	45	90	135	180	225	270	315
XB/R	CP	CP	CP	CP	CP	CP	CP	CP
1.4200	.1485	.1554	.1042	.0675	.0759	.0800	.0881	.1108
1.4600	.1551	.1590	.1033	.0666	.0759	.0803	.0888	.11??
1.5100	.1641	.1658	.1056	.0667	.0781	.0827	.0911	.1171
1.5500	.1639	.1625	.0994	.0605	.0752	.0803	.0882	.1145
1.5900	.1663	.1642	.0975	.0591	.0756	.0806	.0870	.1134
1.6300	.1641	.1614	.0928	.0544	.0736	.0780	.0833	.1081
1.6700	.1607	.1585	.0874	.0487	.0720	.0768	.0803	.1045
1.7100	.1467	.1438	.0763	.0391	.0670	.0714	.0725	.0920
1.7600	.1451	.1490	.0771	.0387	.0691	.0730	.0723	.0915
1.8800	.1127	.1264	.0544	.0143	.0616	.0⌣40	.0546	.0603
2.0100	.0802	.1010	.0316	-.0077	.0544	.0551	.0373	.0270
2.1300	.0401	.0696	.0083	-.0323	.0437	.0434	.0193	-.0044
2.2600	.0078	.0540	-.0145	-.0596	.0328	.0310	.0022	-.0278
2.3800	-.0066	.0512	-.0367	-.0760	.0225	.0205	-.0116	-.0478
2.5100	-.0137	.0392	-.0674	-.0879	.0112	.0089	-.0210	-.0645
2.6300	-.0271	.0179	-.0782	-.0990	-.0047	-.0070	-.0352	-.0827
2.7600	-.0478	-.0171	-.0828	-.1285	-.0381	-.0384	-.0658	-.1071

END

3-87

DTIC